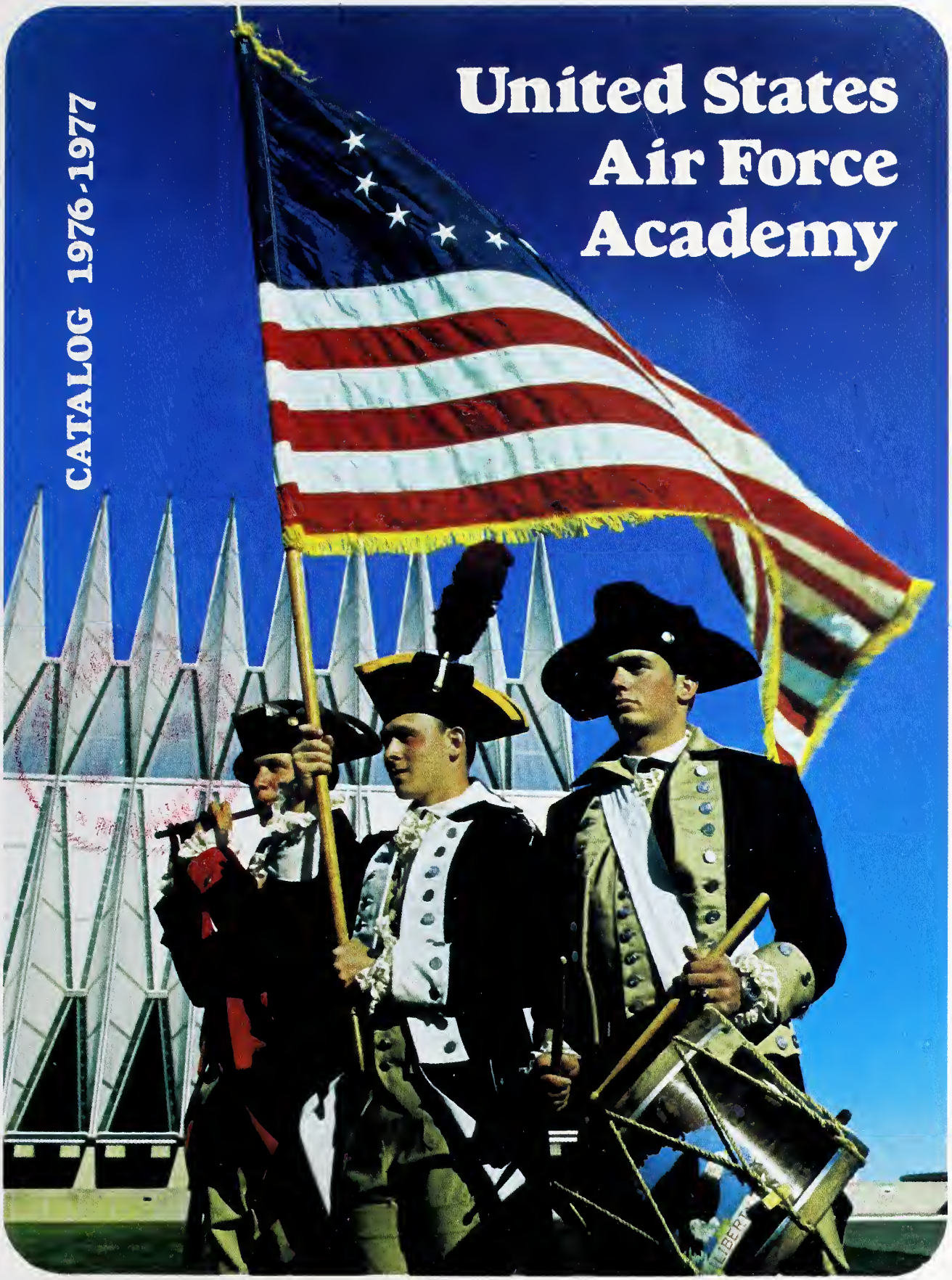
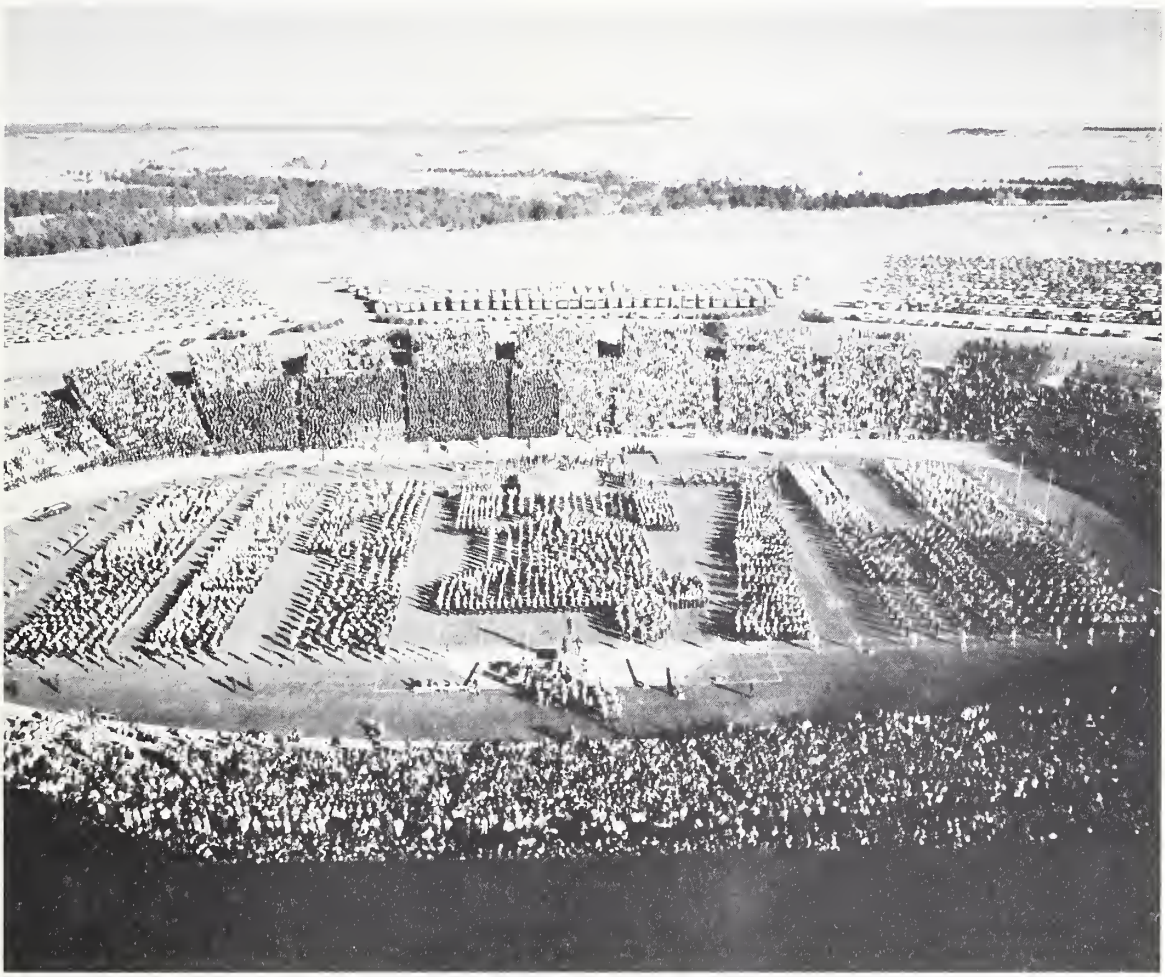
United States Air Force Academy

CATALOG 1976-1977



UNITED STATES AIR FORCE ACADEMY

annual catalog 1976 number 21



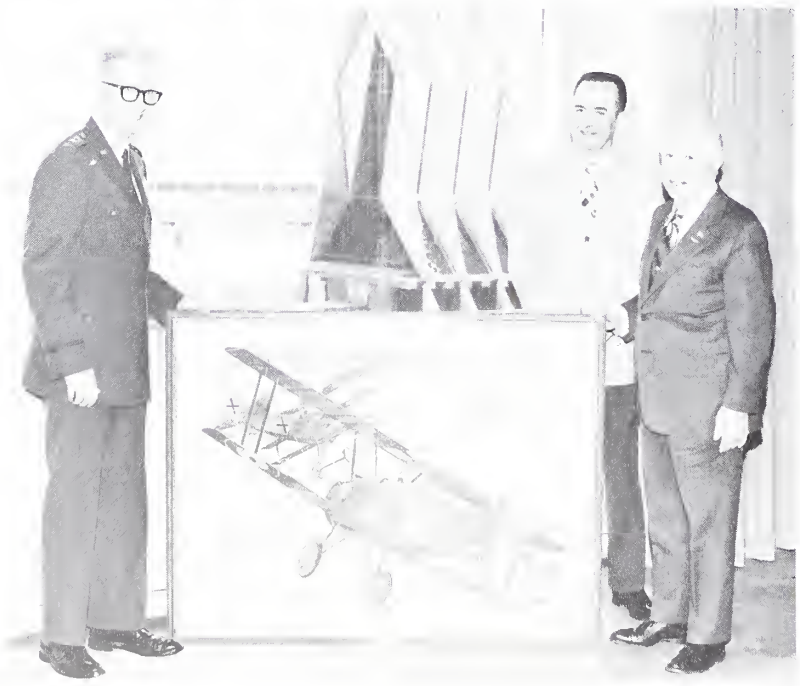
FRONT COVER

Appearing on the catalog cover is the Cadet Continental Color Guard, organized by the cadets to perform at events during 1976. The Academy has been designated both as a National Bicentennial University and a National Bicentennial Air Force Installation.

Cover photos by Bill Madsen, Academy Information Office.

The mission and administration of the Air Force Academy is under the direction of the Superintendent. Serving in the rank of a three star general, he holds a position similar to the president of a university. His functions involve many activities with cadets, visiting dignitaries, and the public.

Lt General Allen with Jacqueline Cochran, famous aviatrix, who donated a collection of her memorabilia to the Academy. During World War II, serving in the rank of Colonel, she was Director of the Women's Air Service Pilots.



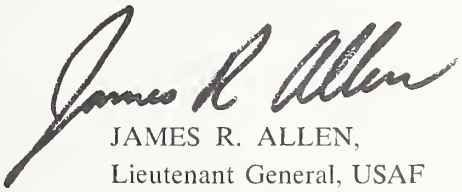
Lt General Allen accepted a group of paintings donated to the Academy by the World War I Overseas Flyers. Ira Milton Jones, *far right,* president, and Bert Luetzo, pilot, presented the paintings depicting air action.

To Interested Young Men and Women

The Air Force Academy will provide you with an outstanding education and prepare you for leadership in the United States Air Force. The Academy aspires to your total development through a curriculum uniquely blended with military and aviation leadership, academics, and athletics. The faculty and staff are dedicated to your development through the four years to graduation.

We expect you, however, to earn your Bachelor of Science degree and your commission as an Air Force officer. The mental and physical tasks involved in this achievement are demanding, but if you are positive, energetic, and motivated you can make it through all of the experiences and the challenges.

I hope that you will review the information contained in this catalog very carefully and then, based on this factual information, make your own decision about applying. You must be prepared to accept the commitment not only to succeed at the Academy but also to serve your country as an officer in the United States Air Force for a minimum of five years after graduation. Most of our graduates remain in the Air Force for a full career and we would expect you to be open minded about such a career for yourself.



JAMES R. ALLEN,
Lieutenant General, USAF
Superintendent

Bicentennial mural painted by Paul Baker, Academy artist

CALENDAR 1976-1977

3 Jun 76	Thursday	Summer Term Begins
28 Jun 76	Monday	Class of 1980 Enters
8 Aug 76	Sunday	Summer Term Ends; Transition Begins
12 Aug 76	Thursday	Fall Semester Begins
14 Aug 76	Saturday	Transition Ends; Acceptance Parade
6 Sep 76	Monday	Holiday, Labor Day
11 Oct 76	Monday	Holiday, Columbus Day (Study Day)
13 Oct 76	Wednesday	Midsemester Final Exams
25 Oct 76	Monday	Holiday, Veterans' Day
24 Nov 76	Wednesday	Thanksgiving Holiday Begins
28 Nov 76	Sunday	Thanksgiving Holiday Ends
16 Dec 76	Thursday	Final Exams Begin
21 Dec 76	Tuesday	Fall Semester Ends; Christmas Leave Begins
4 Jan 77	Tuesday	Christmas Leave Ends; Spring Semester Begins
21 Feb 77	Monday	Holiday, Washington's Birthday
7 Mar 77	Monday	Midsemester Final Exams
18 Mar 77	Friday	Spring Break Holiday Begins
27 Mar 77	Sunday	Spring Break Holiday Ends
16 May 77	Monday	Final Exams Begin
20 May 77	Friday	Fall Semester Ends
29 May 77	Sunday	Graduation Week Begins
30 May 77	Monday	Holiday, Memorial Day
1 Jun 77	Wednesday	Graduation Day, Class of 1977

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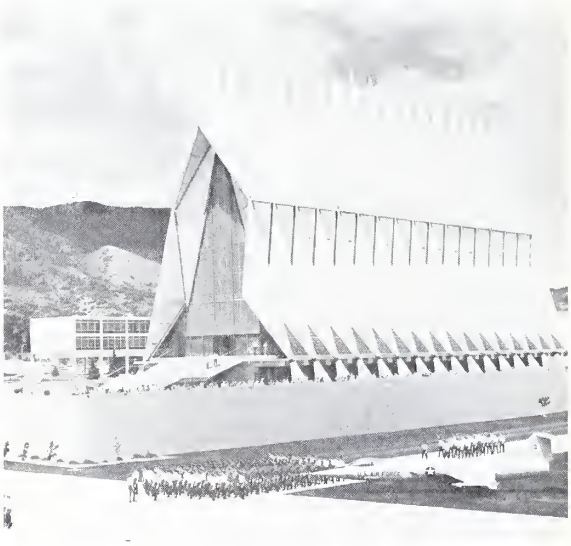
HISTORY

Pioneer Log Cabin, built in 1869, on the Academy site



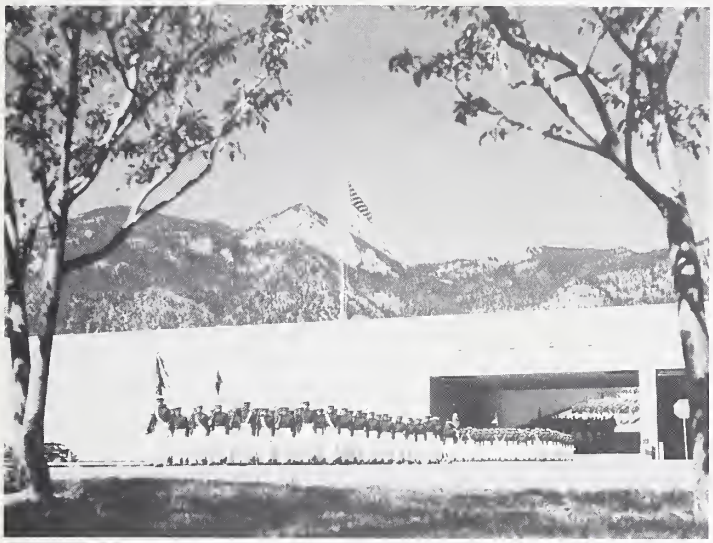
Cadet Chapel, dedicated in 1963, at the Air Force Academy

Our century has seen the birth and tremendous growth of American military aerospace power. The aviation pioneers of World War I prepared the way for the decisive role played in World War II by both tactical and strategic airpower. After the second war, our nation's leaders realized the growing importance of airpower to free-world defense, and in 1947 Congress established the United States Air Force as an independent branch of service.

The Air Force saw the need for an academy specifically designed to educate a nucleus of career officers for the new service. On April 1, 1954, Congress authorized establishment of the Air Force Academy and President Eisenhower signed the legislation.

The Secretary of the Air Force appointed a site selection committee, composed of prominent civilian and military leaders, to screen sites throughout the country to find an appropriate spot for the new academy. Pending the selection of a permanent site, a temporary location at Lowry Air Force Base in Denver was prepared to accept the first class. On July 11, 1955, the class of 306 cadets was sworn in and the Academy was dedicated.

An Academy staff member, who was asked by the selection committee to survey some areas in Colorado, spotted a large expanse of land just north of Colorado Springs that impressed him tremendously. He expressed his enthusiasm to the selection committee who arranged to inspect the location. They explored the land on horseback and then flew over the site with Charles A. Lindberg, a member of the committee, at the controls. They too were impressed with the site, located along the Rampart Range of the Rocky Mountains, with Pikes Peak towering in the background. They liked the scenic land formations divided into mesas and valleys with picturesque pine trees and rugged rocks. After screening numerous locations and visiting proposed sites in many states, the committee agreed on this unique site in Colorado.



Bring Me Men Arch

The Eagle Statue

Lt. General Hubert R. Harmon was appointed by the President as the first Superintendent of the Academy. Under General Harmon's direction, the Academy staff designed a balanced program of academics, leadership, and athletics. With the goal of producing a well-rounded officer, the core curriculum combined courses in the basic and advanced sciences with those in the humanities and social sciences. Cadets were free to choose electives in their special fields of interest, giving the course of instruction added diversity.

While a cadet way of life, a tradition, and a curriculum were being formed at Lowry, work got underway in the fall of 1955 on one of the greatest construction projects in the nation's history. The cadet area was located atop a mesa, over 7,000 feet in altitude, appearing very high in the sky and remarkably appropriate as the school to prepare future leaders for the conquest of space. On August 29, 1958, cadets began to move into their new quarters, and on June 3, 1959, the Academy commissioned its first officers.

Since the first class graduated, the Cadet Wing has grown to over 4,000 members and they have now developed their own heritage. One of the landmarks of the Academy is the Eagle Statue in the cadet area with its inscription "Man's Flight Through Life is Sustained by the Power of his Knowledge." Another is the "Bring Me Men" legend over the archway which the cadets march through to reach the parade ground. Although the legend is expected to remain, women cadets will be marching with the men through this arch beginning in 1976. The admission of women was authorized by legislation passed by the Congress and signed by President Gerald R. Ford on 7 October 1975. The first group of young women have been offered appointments in the Class of 1980 to be admitted on 28 June 1976.

1. MITCHELL HALL (Cadet Dining Hall)
2. AERONAUTICS LABORATORY
3. FAIRCHILD HALL (Academic Building)
4. VANDENBERG HALL (Cadet Dormitory)
5. CADET GYMNASIUM
6. ARNOLD HALL (Cadet Social Center)
7. PLANETARIUM
8. HARMON HALL (Administration Building)
9. CADET CHAPEL
10. SIJAN HALL (Cadet Dormitory)
11. FIELD HOUSE

FACILITIES

THE Academy site encompasses 18,000 acres of former ranch land, divided into five mesas with valleys in between. This expanse of land allowed sufficient space for the flying training programs and for further expansion of the facilities to accommodate additional students.

Dominating the western side of the reservation are the majestic mountains with renowned Pikes Peak in the distance. The site adjoins the sweeping plains to the east. On all sides are spectacular scenes of nature to frame the modern campus. The cadet area, which is the main complex of the Academy, is constructed on the mesa or ridge at the north end of the site. The buildings are designed in contemporary architectural style featuring glass, aluminum, steel and white marble. Some buildings have been named for famous Air Force leaders.

VANDENBERG HALL, a cadet dormitory, has 1,320 rooms, squadron areas, hobby shops, and a cadet store. It was named in honor of General Hoyt S. Vandenberg, former Chief of Staff of the Air Force.

SIJAN HALL, an 830-room dorm, was named for the late Captain Lance P. Sijan, Class of 1965, Medal of Honor winner.

FAIRCHILD HALL, the cadet academic building, contains classrooms, laboratories, lecture halls and faculty offices as well as a cadet dispensary and the Academy Library. It was named for General Muir S. Fairchild, pioneer of Air Force education. Near the academic building are an Aeronautics Laboratory and a Radio Frequency Systems Laboratory.

MITCHELL HALL, the cadet dining hall, accommodates all cadets at one sitting for meals. It was named for General Billy Mitchell, pioneer of military aviation.

ARNOLD HALL, the cadet social center, includes a ballroom, auditorium, bowling alley, recreation rooms, lounges and snack bar. It was named in honor of General Henry H. "Hap" Arnold, World War II Air Force leader.

HARMON HALL, the administration building, houses the offices of the Superintendent and his staff. It was named for Lt. General Hubert R. Harmon, first Superintendent of the Academy.

THE PLANETARIUM, containing a modern projector which displays the heavens, is used for cadet instruction and public showings.

THE CADET GYMNASIUM AND FIELD HOUSE contain facilities for intramural and intercollegiate sports. The gymnasium has two swimming pools (one olympic size) and many athletic courts and areas. The field house is a unique sports arena which has a multi-purpose area utilized for indoor track and practice of football and other sports; a 6,600-seat basketball court; and a 2,600-seat ice hockey arena.

THE CADET CHAPEL, focal point of the cadet area, is striking in its design with 17 towering spires which admit light to the Protestant chapel through colorful stained glass. Catholic and Jewish chapels and an All-Faith worship room are located on the lower floor level.

Located in areas south of the cadet complex are: the Academy Hospital which serves the cadets and other military personnel and dependents; the Officers Club and bachelor and visiting officers quarters; Douglas Valley and Pine Valley family housing areas with public schools; the Community Center shopping area for military personnel and families; the Academy Preparatory School; and a Supply and Services area to support the Academy.

A 3,500-foot airstrip, located on the southeast perimeter of the Academy, serves the lightplane, sailplane, parachuting and parasailing activities of the Cadet Aviation Program. The airstrip is also used for flying activities by the Academy Aero Club.

Falcon Stadium and Eisenhower Golf Course, located east of the cadet area, were financed with private funds donated through the Air Force Academy Foundation. The Farish Memorial recreation area in the nearby mountains of the Rampart Range was donated to the Academy for cadets and Academy personnel.

THE ACADEMY'S PURPOSE

The purpose of the Academy is to prepare cadets
to be professional officers in the United States Air Force.
Because this purpose is vitally important to national security,
the Academy must maintain discipline and control over all cadets.

On 28 June 1976, the Class of 1980 will be admitted to the Academy. For the first time, women cadets will be allowed to attend the Academy and will be enrolled in the class with men cadets. With few exceptions, women will undergo the same training and instruction as men cadets. The exceptions will be in those few areas in which physical differences between men and women will require separate training in military and athletic programs.

If you become a cadet, you will be sworn into the Air Force soon after you arrive at the Academy. Your ability to live under military discipline will be tested during the next six weeks when you undergo a rigorous indoctrination to military life. This program, called Basic Cadet Training (BCT), is led by upperclassmen under the supervision of Air Force officers. The training is highly demanding, mentally and physically. It will continually challenge you and test your endurance, but you can prove equal to the expectations. The cadets who have the least problems are those who are willing to adapt to their new life and put forth their best efforts to succeed. If you successfully complete BCT, you will become a member of the Air Force Cadet Wing and begin the fall semester as a fourth class cadet.

Completing BCT is an accomplishment for which you can be justly proud, yet the requirements for you as an Academy cadet are only beginning. Now you must concentrate your full attention on the education and training which is to continue for four years. You must abide

by military rules that restrict your personal activities, and you must meet required standards of performance in all phases of the curriculum. Three major programs are included in the curriculum, as follows:

The leadership, military training, and aviation programs are a distinctive aspect of the Academy which serve as a foundation to build a professional career as an Air Force officer. You will gain insight into the operation of the Air Force and the military responsibilities of an officer. You will start to develop leadership skills in your role as a follower during your first two years at the Academy. These skills will then be refined as you analyze yourself in leadership roles during your last two years. You will have opportunities to participate in varied flight programs which provide a foundation for the Air Force flying mission.

The academic program enables you to acquire the intellectual background for Air Force leadership. The curriculum includes a general education in the basic and engineering sciences, the social sciences, and the humanities, as well as specialization in a major of your choice. Courses in aeronautics, astronautics, and other sciences will apply to many Air Force requirements in this age of aerospace technology. Elective courses are offered if you wish to increase your knowledge of various subjects or to prepare for the possibility of graduate education in the future.

The physical education and athletic program involves all cadets in the development of physical fitness for leadership. You will learn a variety of skills with emphasis on competition, aquatics, body development, and recreational sports. You will acquire techniques of participating and coaching in individual and team sports. You will compete in many intramural athletic contests, and if talented in a sport, you may play on an intercollegiate team representing the Academy.

The keynote of the entire curriculum is challenge, both mental and physical. The reason for these challenges is to develop superior officers for the Air Force — officers committed

to duty, honor, and service to country. By completing the four-year program, you will graduate with a Bachelor of Science degree and a commission in the Regular Air Force.

The curriculum is structured to provide a background for flying training leading to pilot or navigator ratings following graduation. Men cadets qualified for flying will be expected to attend flying training during their first year in the Air Force. Women cadets are not presently eligible for pilot or navigator training as they are excluded by law from these and other combat specialties. In the near future, a group of selected women now in the Air Force will attend pilot training on a test basis. If these tests are successful, women cadets may become eligible for some flying training and future rated assignments. Academy graduates who do not attend flying training will be assigned in a combat support area.

Flying graduates must remain on active duty in the Air Force for five years following the completion of pilot or navigator training. Non-flying graduates must serve on active duty for five years following graduation from the Academy. After the experience of serving in the Air Force, a majority of the graduates have elected to remain for a professional career.

Your Decision About Applying

The Academy wants to be frank with you about what to expect if you become a cadet. The transition from civilian to cadet life is not easy. Satisfying all phases of education and training through four years as a cadet calls for application, dedication, and sacrifice.

Before you make a decision about applying for the Academy, you should ask yourself this question, "Why am I interested in attending the Air Force Academy?" Your primary motivation for seeking an appointment is most important, so you should carefully examine your reasons. First, you should make sure the Academy is *your own* choice. Do not let your parents, your friends, or others influence your decision. The Academy has found that outside influence, no matter how well intentioned, seldom provides sufficient desire for a cadet to overcome all the problems he will encounter.

Be certain that you are not primarily motivated to gain the prestige of attending a service academy. Although Academy cadets may be admired by their associates, cadet life from the inside looking out is not always glamorous. The fourth class (freshman) year is especially difficult. It is a year of development in a totally new environment. As a fourth classman you will have very little personal freedom and only a few privileges to be away from the Academy. As you progress through the years, you will have more privileges, but along with the increased freedom you will have more responsibilities of leadership in the Cadet Wing.

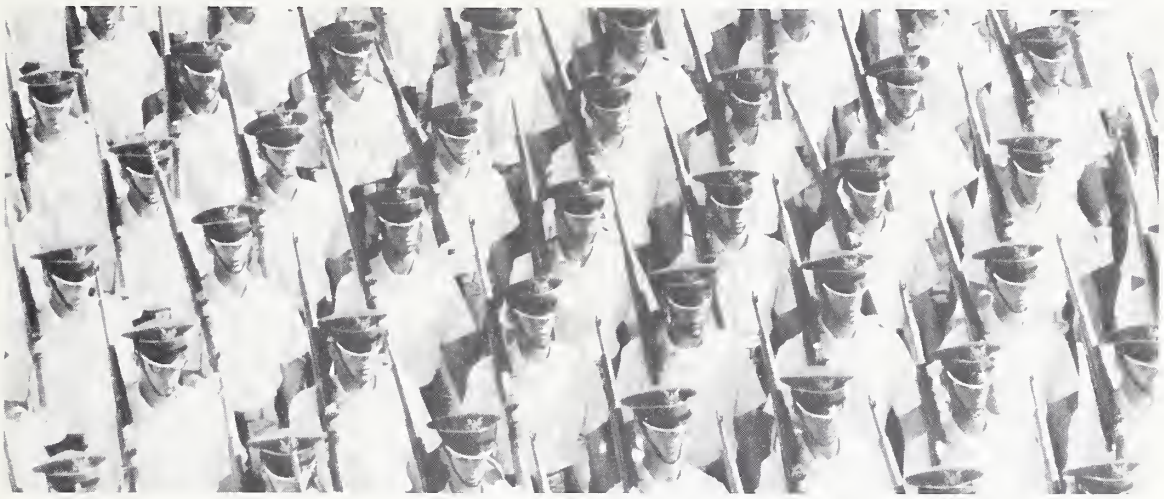
Be reasonably sure that you want to attempt the military life of a cadet and an Air Force officer. Ordinarily, young men and women do not have their careers totally charted when they graduate from high school. Therefore, if you simply do your part to investigate the Air Force Academy and opportunities in the Air Force, that is all the Academy expects of you. Further information and motivation will be provided after you become a cadet.

Be sure that you are willing to remain flexible about the career area to which you may be assigned immediately upon graduation. Although there are a variety of career areas in this age of expanding technology, those available each year will depend upon the needs of the Air Force at the time. Refer to the Air Force Career chapter of the catalog. Additional information and counseling on career opportunities will be explained fully if you become a cadet.

Be sure that you do not seek an Academy appointment just to receive a four-year cadet scholarship. In return for the government's investment in your education and training, you will be expected to learn, to perform, to obey, and to lead. The Academy has an obligation to the Air Force, to the Congress, and to the American taxpayers to produce professional military officers. And you, in turn, have a responsibility to those groups to do your best.

If your primary motivation is to accept the challenges of the total Academy program and service in the Air Force, then you have passed the first test toward making a positive decision. Before making your final decision about applying for the Academy, you are advised to weigh all of your characteristics against the typical qualities of a successful cadet and an officer. If you enjoy responsibility and accept discipline, welcome new experiences and opportunities, and like to excel and lead others, you should have the attributes to become a successful cadet. And if you find satisfaction in serving others through a sense of duty and morality, you should also have the assets to serve your country as an officer. The decision is yours.

LEADERSHIP, MILITARY, AND AVIATION PROGRAMS



The leadership, military training, and aviation programs are directed by the Commandant of Cadets. The Deputy Commandant for Military Instruction and members of his staff plan and supervise these programs. The instruction is based on a four-year progression from a basic cadet without military experience to an Air Force officer with the knowledge, skills, and motivation for his profession.

Leadership is based on the whole person concept, meaning that many attributes of character, dedication, and professionalism are necessary to complement your academic education and complete your preparation for Air Force service. Fulfilling these high standards of performance, conduct, and military bearing are not easy. As you develop you will realize that worthwhile goals in life do not often come easy, but in the long run the rewards are usually worth the efforts. You realize, also, that your challenge of leadership could involve great responsibility in terms of national and international security.

During fall and spring semesters, you will have classroom instruction in military studies including special presentations by well known military and civilian leaders. You will be active in many types of summer military training which broaden your background. You are evaluated on your performance and interest in these training programs just as you are in academic courses. You receive ratings on aptitude for commissioned service and leadership which are an important part of your cadet progress and graduation requirements.

The mission of the Air Force is to fly and, when the government so directs, to fight in defense of the national interests. Since the total mission is based on flying, the aviation training you receive as a cadet is a significant part of your career preparation. Aviation programs give wide flexibility to develop any previous flying experience and allow beginners the stimulating experience of learning professional flying skills. Whether or not you are qualified to fly, you will receive academic and flight instruction in several aviation courses. You will also have the opportunity to participate in additional flying within the curriculum or on an extracurricular basis.

BASIC CADET TRAINING

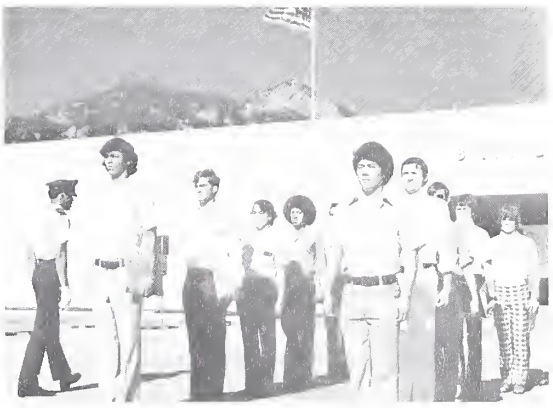
Your first exposure to military life occurs in Basic Cadet Training, a rigorous program of orientation held during the summer you enter the Academy. Your performance and attitude in this program are critical factors in your future success at the Academy. Since it is vitally important for you to understand what is expected of you, a detailed description is given as follows:

Arrival

When you arrive at the Academy, you may be on your own, away from home, for the first time. Although there are many others in your class you may not know anyone. You could suddenly feel alone in a strange new environment without parents or friends to turn to. But remember, you are not alone and almost everyone else feels the same way you do.

You will soon make friends among your classmates, including some from your own state or area. Communication between members of your own class is encouraged to help build a sense of togetherness and esprit de corps. Upperclassmen are available to help you adjust to the Academy and give you a sense of identity and belonging. Regular question and answer sessions are held to encourage understanding between basic cadets and upperclass cadets.

During the first few days you are busy with clothing issue, forms, inoculations, validation exams, and squadron and dormitory room assignments. Your hair is cut in a short style for ease and comfort during the summer training.



Oath

Taking the oath to enter the armed forces of the United States is one of the biggest decisions of your life so far. By this pledge of loyalty, you promise to support and defend the Constitution of the United States against all enemies and to discharge faithfully your duties as a cadet. The oath is a commitment to carry out national objectives established by civilian leaders in congressional and executive branches of government. You must be willing to abide by their policies in times of peace or war. If you have any reservations about taking the oath, you must resolve them in your own mind before accepting an appointment.

Honor Code

"We will not lie, steal, or cheat, nor tolerate among us anyone who does." You must live up to the high ideals of this Cadet Honor Code throughout your training. As a new cadet, you learn to guide your life by the principles of honesty and integrity. Your word is trusted, and you can trust explicitly the word of your fellow cadets. The Honor Code belongs to all cadets, and the cadets strictly enforce it. As you live under the code, you begin to realize its importance to your future in the Air Force.

Transition

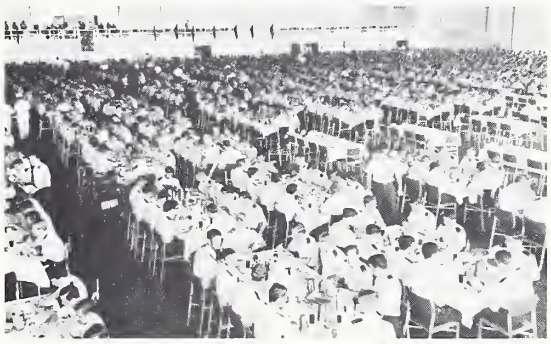
After processing is completed, your transition to military life begins with six weeks of Basic Cadet Training, commonly known as "BCT." First Classmen (seniors) serve as instructors during your summer training. These cadets, who were put through the same strenuous program three years earlier, expect your best. Throughout the summer everything is a stiff challenge, highly competitive, and rapidly paced. The program will tax your endurance and force you to find hidden reserves of energy to keep up. The difference between the Academy and a civilian college becomes clear as you face the duties placed upon you.

You will have many tasks to do and a minimum of time to accomplish them. All of this has a purpose: to involve you in a number of activities and teach you how to perform effectively in a short time. If you are motivated to do your best, you will meet the challenges and reach new heights of performance and achievement. Upperclassmen are available to help motivate you through positive reinforcement of your abilities and leadership techniques designed to stimulate your success.

BCT in the Cadet Area

One of the first things you learn is how to march and drill. You perform close order drill and the manual of arms, and you learn to march in military ceremonies and parades. Physical conditioning is a part of your daily training which includes exercises, running, swimming, and competitive sports. The physical exertion is strenuous and tiring. It will be easier if you prepared yourself through vigorous physical activity before you entered the Academy. The obstacle course is the supreme test of your physical fitness in which you extend the limits of your ability and build the confidence to face stress. You learn to run the obstacle course, racing against the clock, over, under, and around various barriers.

Your training is not limited to drill and conditioning, but continues even in your room and in the dining hall. You are out of bed by at least six in the morning, and you straighten your room before going to breakfast. You must arrange your belongings and make your bed in a standard way. During strict Saturday morning inspections, you stand at attention while upperclassmen meticulously check over your room and uniform. You learn to take pride in your personal appearance and the cleanliness of your area. You also learn to eat in a military environment. Although you must follow the rules of conduct, you are allowed ample time to eat. And the food is good, maybe the best dining hall food you could find. It is served family style, but the "family" is very different from yours at home. All basic cadets and upperclassmen eat at the same time in one huge dining area.



In the evenings, you are still busy studying basic hygiene, cadet rules and regulations, and other subjects. You must stand when upperclassmen or officers enter your room and salute when they leave. You must square corners when walking. You must report for shower formation and participate in exercises. Each evening, however, there is time set aside to allow you to relax and attend to personal needs without interference. Then you go to bed for eight hours.

BCT in Jack's Valley

Jack's Valley is a wooded training area just north of the athletic fields. At this encampment upperclassmen will put you through rugged training and confidence courses under field conditions.

You wear fatigue uniforms and combat boots, and you live in tents. Life in the valley is challenging and competitive, but you gain satisfaction as your endurance increases.

You develop teamwork in the leadership reaction course as small groups of basic cadets learn to solve problems and work together. Patrolling, land navigation, and tactical exercises simulate the operation of small units in combat. On the assault course you go through obstacles, bayonet drills, and basic hand-to-hand combat. You learn to fire the M-16 rifle and the .38 calibre revolver. The confidence course takes you through another series of obstacles. Teamwork and encouragement from classmates, along with your own pride and spirit, enable you to make it through this difficult course. In spite of your physical exhaustion at the end of each day, you find Jack's Valley is a different and stimulating experience.

Activities

Regular breaks are scheduled each day to give you some time to relax and recover your energy. Also, special programs are arranged which are entirely different from your military training. One of these is the aviation program to introduce you to the Air Force flying mission. You will receive initial training and flights in the T-37 and T-43 jet training aircraft. If this is your first chance to go up in an Air Force jet, you will never forget the experience. You will also experience a parasail ride, an exhilerating aviation sport. You will spend one day "Dining Out" in the home of an Air Force officer or noncommissioned officer. You will have dinner and get acquainted with a typical Air Force family.

Field Day

The final competition at the end of BCT occurs on Field Day. Now you are highly conditioned physically and will discover a sense of pride and self-esteem that you have not experienced before. You and your squadron teammates compete against the other BCT squadrons in events such as distance races,

pentathlon and other selected events. This gives you a final chance to demonstrate your new confidence and progress, not only to the upperclassmen but to hundreds of spectators as well. It shows how well your squadron pulls together as a team to gain additional points toward winning the honor squadron competition. Winning at Field Day takes the same kind of spirit and teamwork that have carried you through the summer. To close the day's events, the cadet parachute team lands in the athletic area with a streamer for the flag of the winning squadron.

Acceptance Parade

After BCT when the rest of the Cadet Wing has returned from summer programs, you will receive your shoulder boards during the Acceptance Parade. You are now officially accepted into the Cadet Wing. The upperclassmen are smiling, you notice, and they seem human after all. Now you can appreciate them and the tasks they put you through during the summer. You have gained spirit, toughness, patience, pride, and teamwork. You are physically and mentally prepared for the challenges of your fourth class year.

Parents' Weekend

Over the Labor Day holiday, the Academy invites the parents of all fourth class cadets to visit their sons and daughters and attend scheduled functions. A special event of this weekend is a Cadet Wing Parade. The cadet squardrons hold an open house and sponsor various activities. The Superintendent, Dean of the Faculty, Commandant of Cadets, and other members of the staff will brief the parents. Cadet facilities are open to them including the academic building, dormitories, field house, gymnasium, chapel and dining hall. Social functions, a chapel service, and a band concert are scheduled. Fourth class cadets have privileges to leave the Academy at scheduled times during that weekend. Hotel and motel accommodations are available to parents near the Academy in Colorado Springs.

LEADERSHIP AND MILITARY TRAINING

Fourth Class Year

In mid-August, you enter the fourth class academic year, consisting of fall and spring semesters. Military training during this year places you in the role of a follower as a necessary first step in your leadership development. In this role you are challenged both physically and mentally to increase your self-confidence and self-discipline. You are provided with a practical and useful perspective of leadership. This is the Functional Concept of Leadership in which you are given opportunities to analyze yourself and other cadets in leadership situations. This concept was introduced to you during BCT when you were asked to analyze your classmates. Now as a fourth classman, you will continue this practice by analyzing the performance of upperclassmen in leadership positions.

Your first military studies course helps you to understand the operation of the Air Force in support of national objectives and the responsibilities of the officer in accomplishing these goals. You study many aspects of leadership within the Air Force and the Cadet Wing, including the practical duties performed by the military manager. You gain an insight into the life of officers, their career patterns, promotion opportunities, and pay benefits.

Third Class Year

All cadets must take SERE (Survival, Evasion, Resistance and Escape) training during their third class summer. The training is conducted at the Academy and in the nearby Rocky Mountains. The course is fully accredited by the Air Force and fulfills the survival training requirements for Air Force personnel. In addition to SERE training, you must choose one of the following three-week programs:

Basic Airborne Training — Instruction and practice in basic skills of static line parachute jumping, given by the U. S. Army at Fort Benning, Georgia.

The Noncommissioned Officer Program — Service at Air Force installations to observe and gain a better understanding of the duties of enlisted personnel.

The Soaring Program — Instruction in ground school and dual and solo flights in Academy sailplanes to fulfill requirements for an FAA Pilot Certificate-Glider Rating.

Special Training Programs — Participation in temporary programs conducted to fill a need to test a new concept prior to implementation.

During the academic year, you begin to leave the followership role and assume limited leadership positions in the Cadet Wing. You take a second course in military studies to assist you in accomplishing these duties and to prepare you for ever increasing responsibilities in your second and first class years. The course focuses attention on developing communication skills which cadets and officers should possess to be effective leaders. You learn the techniques of teaching and speaking which will help you to communicate as a leader. You will also participate in assuming instructional and leadership roles. Through those roles, you practice the communication techniques which are of primary importance when you become an instructor of lower classmen and a leader in the Cadet Wing.

Second and First Class Years

Primary emphasis during the final two years is placed on increased leadership responsibility and practical knowledge of how the Air Force operates. You must assume at least one leadership position in a summer program for third or fourth classmen. You may participate in a three-week tour of duty with an Air Force unit. This tour, known as "Operation Third Lieutenant," allows you to observe and experience some of the duties of junior officers. In addition, you will select from several optional summer programs including the following:

Parachuting — Offers the option of attending Basic Airborne Training at Fort Benning, if not selected during your third class summer, or of participating in free-fall parachuting programs at the Academy.

Soaring — Advanced programs are available to those who have completed the basic course during their third class summer.

Light Plane Flying — Required for all first classmen who will enter Air Force pilot training following graduation. Instruction is conducted in T-41 aircraft at the Academy Airfield. It includes dual and solo flight training with related ground school.

Aviation — Required of all cadets not programmed for entry into pilot training. Knowledge is gained of the Air Force flying mission through academics, trainers, simulators and flight experience in T-43 jet aircraft.

Navigation Instructor — Offers selected cadets technical and professional training as flight instructors in other aviation courses. Leadership and skill training parallels future operational Air Force flying roles.

**Underwater Demolition and Open Circuit Scuba Training* — Instruction in scuba diving and underwater demolition tactics conducted by the U. S. Navy at San Diego. Satisfactory completion results in being certified world-wide scuba qualified.

**Combat Leadership (RECONDO)* — Instruction in the tactics of small element leadership conducted by the U. S. Army at nearby Fort Carson, Colorado.

In your second class academic year, you take a third military studies course which emphasizes the problems encountered by leaders of operational Air Force units and relates the applicability of these situations to the Cadet Wing. Information is included on current weapon systems and their employment in offensive and defensive airpower. The course is held in a workshop environment where each cadet is given an opportunity to make decisions governing the simulated tactical employment of operational units.

As the final step in the leadership program prior to your graduation and commissioning as an officer, you will take full responsibility for the leadership and training of the other three classes. The fourth military studies course, which pertains to the responsibilities and obligations of a junior officer, prepares you for your initial active duty assignment.

*The above programs conducted by the Army and Navy are not open to women cadets at this time due to requirements of those services. If the programs become available to women in the future, it is anticipated that women cadets will be allowed to participate.

AVIATION PROGRAMS

The flight environment provides a varied exposure to aviation throughout your years at the Academy. Some courses are mandatory to insure that every cadet receives a broad aviation background. The remainder are electives available in the summer. The overall program includes orientation flights, parasailing, soaring, parachuting, jet aircraft operations, flight physiology, navigation and astronomy.

The aviation experiences are completed by a mandatory course in the second or first class year. Cadets going to pilot training after graduation take a light plane program with solo flights. Cadets not qualified for pilot training take a course in aviation fundamentals.

The following is a general description of major flight programs available at the Air Force Academy.

Flying Introduction

Your aviation education begins during Basic Cadet Training with parasailing orientation and indoctrination flights in jet aircraft. The early timing of this training, during your rigorous transition from civilian to military life, is designed to provide a clear realization of your future role in the flying Air Force.

Soaring Program

In your fourth class year, you will be given an orientation in soaring with several flights over the Academy. Future soaring training, held on a year-round basis, is available to selected cadet volunteers. The basic course culminates with the award of an FAA private glider license, and advanced training leads to a soaring instructor's license. All of the training is conducted in Academy sailplanes and supervised by Air Force pilot instructors. A majority of the instruction is given by cadets who are certified FAA soaring instructors.

Parachute Training

Parachute training is available at the Academy to selected cadets who volunteer and meet stringent physical requirements.

The basic course, which involves five free-fall jumps, trains you for an emergency ejection from a disabled aircraft. Selected cadets from the basic course will progress through the advanced courses to become parachute instructors. These cadet instructors have the opportunity to be members of the Academy's parachute team which has been highly successful in precision parachute competition. Air Force aircraft are used for parachute training with supervision provided by the airmanship staff. Most of the training is given by certified cadet jumpmasters who have completed the entire parachute program and have proved their capabilities.

Pilot Indoctrination

All qualified first class cadets who plan to enter Air Force undergraduate pilot training after graduation must complete a pilot indoctrination program. The flight instruction is given in the T-41 aircraft, a military version of the Cessna 172. The instruction is conducted at the Academy Airfield by the 557th Flying Training Squadron of the Air Training Command. This training, including dual and solo flights, totals approximately 25 hours. Associated ground school courses are taught by the airmanship staff. If you qualify for this course, you will have your first chance to solo a powered aircraft which is a memorable achievement of your final year at the Academy.

Aviation Fundamentals

All cadets who are not programmed for pilot training must complete a fundamental aviation course. The Air Force flying mission and the role of aircrews are taught in the classroom, flight simulators, and T-43 aircraft. You will receive approximately 20 hours of airborne training in this modern flying laboratory. Regardless of your future career aspirations in the Air Force, you will have the opportunity to experience the roles of the combat force. In this manner, all Academy graduates will have a better understanding of the Air Force mission.

Extracurricular Flying

If you want to pursue flying as a cadet extracurricular activity, you may take additional light plane training as a member of the Cadet Aviation Club. You may earn FAA ratings from private pilot through instructor pilot. Flight training is available beginning the second semester of your fourth class year. Training is conducted in club aircraft which includes four Cessna 172s, a Beechcraft Sundowner, a Beechcraft Sierra, and two Grumman American Travelers. Instruction is given by both military and civilian personnel who are certified FAA flight instructors.

Cadet Balloon Club

If you would like to participate in an aviation activity that dates back to Leonardo de Vinci, you may join the Cadet Balloon Club which has three hot air balloons available for flights in the Academy area. You will learn the skills of unpowered flight in man's first flying machine. Club members may earn an FAA commercial instructor balloon rating.

Navigation Introduction

Courses in navigation are open to cadets as electives regardless of qualification for flying. Navigation courses will further your knowledge and skills of the flight environment. Basic and intermediate navigation courses enable you to learn flight concepts, instruments, and atmospheric factors in the classroom. This background is the basis for practical application in flight trainers and cockpit simulators. The skills achieved in the classroom and laboratory are then applied during flight missions in Air Force T-43 aircraft. The flight sorties are accomplished normally on regular academic days.

In addition, you will have some weekend training flights with visits to Air Force bases in order to receive firsthand exposure to various operational flying units and to become familiar with their equipment and aircraft. At those bases, you will have the opportunity to meet and talk with Academy graduates who are now members of flight crews. The navigation courses also enable you to study the avionics systems of current and future aircraft and to work with some of this equipment in flight. You may have the opportunity to achieve cadet instructor navigator status and provide instructional support to cadets in basic navigation courses.

Those cadets who do not meet the qualifications for Air Force pilot training may qualify to attend navigator training. You may obtain the proper background by taking the aviation/navigation courses offered at the Academy. An advanced navigation course will introduce you to skills required in future flying roles in the Air Force.

Astronomy Courses

Astronomy courses which deal with the space environment are also open to cadets as electives. Two aviation science courses in applied and descriptive astronomy provide a fundamental knowledge of the universe incorporating the latest findings of U. S. space explorations. The Academy Planetarium, the Observatory, and T-43 flight laboratories are used to study space relationships.

THE CURRICULUM

Semester Schedule

The Air Force Academy conducts the program of education and training for cadets throughout the year. The yearly calendar is divided into three sessions: a summer term, a fall semester, and a spring semester.

The summer term is approximately nine weeks long. Summer training programs begin immediately following graduation. The new cadet class enters the Academy on a Monday, which usually occurs the last week in June. The basic cadet summer training schedule consists of a few days of processing followed by a six-week training period.

The three upper classes receive leadership and military instruction at the Academy. Members of these classes may also be assigned to other military installations and designated locations for specialized training. All cadets except the new class receive three weeks of leave during the summer.

Fall and spring semesters contain approximately 17 weeks of instruction or 42 lessons per semester. The fall semester begins about mid-August and ends during the week before Christmas. The spring semester begins during the first week in January following Christmas leave and ends the last week in May. Each semester includes a final examination period of five days.

The academic week in the fall and spring semesters consists of five days, Monday through Friday, with six 60-minute class periods per day. Unscheduled class periods are devoted to study in the Library or cadet rooms. Saturday mornings are utilized for parades, inspections, military training, and other events of the Cadet Wing.

Grading

The quality of your performance in a graded course is reported by means of letter grades. These grades denote character of work and are assigned grade points as follows:

Grade	*Character*	*Grade Points Per Semester Hour*
A	Excellent	4
B	Good	3
C	Satisfactory	2
D	Passing	1
F	Failing	0

Several courses, particularly Military Training, Airmanship and Physical Education, are graded on a P (Pass)/F (Fail) basis.

Additional letter grades of W (Withdrawn), WP or WF (Withdrawn while Passing or Failing, awarded after midsemester), N (No grade, continuing without penalty), and I (Incomplete) may be awarded.

Cadets are graded on quizzes, examinations and assignments prepared outside of class. For each 60-minute class period, you are normally expected to devote 90 minutes to outside preparation. You may be called upon to participate and recite any time you are in class.

A progress grade report is published at midsemester to inform you of your grades. Final grade reports are published at the end of each semester.

Cadet Achievement

Cadets are recognized for achievement in academic courses, military performance, and athletic participation as follows:

1. Cadets who excel in academic courses are placed on the Dean's List at the end of each fall and spring semester. Included are cadets whose grade-point average is at least 3.0.
2. Cadets who excel in military performance are placed on the Commandant's List at the end of each fall and spring semester. The list consists of the top 33⅓% in each class who have demonstrated the greatest cadet effectiveness.
3. Cadets who are on both the Dean's and Commandant's Lists are carried on the Superintendent's List denoting excellence in both academics and military performance.

If your name appears on either of these lists, you are recognized for this distinction by

an appropriate insignia on your uniform. A small silver star denotes the Dean's List, a silver wreath signifies the Commandant's List, and a silver star enclosed in a silver wreath indicates the Superintendent's List. If you achieve one or more of these distinctions, you may be awarded additional privileges.

Recognition for athletic performance is given at the annual Athletic Awards Banquet held during Graduation Week. Individual and team trophies are given to winners of intramural competition. Cadets receive letters and numerals to be worn on athletic jackets for their participation and achievement in intercollegiate competition. Special awards are given for outstanding performance in varsity sports.

Deficiency and Disenrollment

A cadet is deficient in studies at midsemester report or the end of semester/term when one of the following conditions exists: a grade of F or I in one or more courses (graded or pass/fail), a cumulative or semester grade-point average (GPA) of less than 2.00, or a major GPA less than 2.00 in the first class year.

Cadets deficient in studies will be reviewed by a class committee at each midsemester progress report and the end of each semester/term. The class committee will take final action on all cadets whose sole deficiency is one or more I grades obtained through no fault of their own, such as physical injury or sickness. Unless the class committee specifically states to the contrary, cadets deficient in studies will be placed on academic probation.

At the end of each semester or term the class committee will recommend to the Academy Board that a cadet who is deficient in studies be disenrolled for academic deficiency. Exceptions are made if the committee determines that both a cadet's overall performance and the probability of successfully completing the academic program will justify retention. The Academy Board will consider the recommendation of the class committee and make final decisions.

Cadets retained by the Academy Board may be directed to accomplish one or more of the following: repeat or take a specific course during a subsequent semester, underload one course, change academic majors, attend a summer term in place of leave, be turned back to the next succeeding class, or take any other action deemed appropriate.

A cadet whose conduct or aptitude for commissioned service reflects doubt upon personal willingness or ability to meet Academy standards will be placed on conduct or aptitude probation by the Commandant of Cadets. In cases involving gross misconduct, or when a cadet fails to meet the terms of probation, the Commandant will refer the case to a Commandant's Board. The cadet must show cause why he or she should not be disenrolled from appointment for deficiency in either conduct or aptitude. A cadet found deficient in these areas will be recommended to the Academy Board for separation. The Academy Board will consider the recommendation and inform the cadet of its decision.

Graduation Requirements

Men and women cadets will be required to meet the following graduation requirements:

- Demonstrate an aptitude for commissioned service and leadership.
- Be satisfactory in conduct.
- Be proficient in physical education and military training.
- Complete the requirements for the core curriculum and for an academic major, passing all courses (or equivalents) for the core and for the major.
- Meet a minimum standard of a cumulative overall grade point average of 2.0 (C) and a cumulative grade point average of 2.0 in your major.

The core and major's requirements amount to 48 course units for a disciplinary major or 46 course units for a divisional major. Course units are used in place of semester hours to determine a cadet's minimum load for each semester.

SUMMARY OF THE CORE CURRICULUM

For the Class of 1980

In Semester Hours (SH) and in Course Units (CU)

4TH CLASS — FRESHMAN

Summer

Mil Tng 100	5	(SH)
Phy Ed 100	2	
	7	(SH)

Fall & Spring

Beh Sci 110	3	(SH)	1	(CU)
Bio Sci 110	1½		½	
Chem 101-102	6		2	
Comp Sci 100	3		1	
English 111	3		1	
For Lang 111-112-113	4½		1½	
History 101	3		1	
Math 131-132-133-134[1]	12		4	
Mil Stu 121-122	3		0	
Phy Ed 105-106	2		0	
Phy Ed 120	1		0	
Inst Tech 101-102	1		0	
Armnshp 101	0		0	
Aviation 101	½		0	
	43½	(SH)	12	(CU)

3RD CLASS — SOPHOMORE

Summer

Mil Tng 200	2	(SH)
Mil Tng 210	2½	
	4½	(SH)

Fall & Spring

Beh Sci 220	1½	(SH)	½	(CU)
Econ 201-202	4½		1½	
El Engr 210	3		1	
English 212	3		1	
History 202	3		1	
Mgt 203	1½		½	
Math 220	3		1	
Mech 110[2]-210	6		2	
Physics 211	3		1	
Pol Sci 201-202-203	4½		1½	
Elective	3		1	
Mil Stu 221-222	3		0	
Phy Ed 205-206	2		0	
Phy Ed 220	1		0	
	42	(SH)	12	(CU)

(1) If remedial Math is required or if Mech 110 is scheduled in the second semester, Math sequence will be delayed.
(2) Mech 110 is taken in 4th Class year by approximately ½ of the Cadet Wing.

2ND CLASS — JUNIOR

	Summer			
Mil Tng 300	4	(SH)		
	Fall & Spring			
Aero 311-312	6	(SH)	2	(CU)
Beh Sci 330	1½		½	
El Engr 310	3		1	
English 330 or 350	3		1	
History 303	1½		½	
Law 300	3		1	
Philos 310	3		1	
Physics 311	3		1	
Electives	12		4	
Mil Stu 321-322	3		0	
Phy Ed 305-306	2		0	
Phy Ed 320	1		0	
	42		12	

1ST CLASS — SENIOR

	Summer			
Mil Tng[3]	4 or 5	(SH)		
	Fall & Spring			
Astro 332	3	(SH)	1	(CU)
Engr 430	3		1	
English 406	3		1	
Law 400	3		1	
Pol Sci 412	3		1	
Physics 411	3		1	
Electives[4]	12 or 18		4 or 6	
Mil Stu 420	½		0	
Phy Ed 405-406	2		0	
Phy Ed 420	1		0	
	33½ or 39½		10 or 12	

TOTALS

Academic Core Courses	111	(SH)	37	(CU)
Majors Courses	27 or 33		9 or 11	
Physical Education	14			
Mil Stu/Mil Tng	27½ or 28½			
Study Skills	1			
TOTAL CURRICULUM[5]	180 to 187½		46 or 48	

(3) Cadets who complete the flight core (Armnshp 441 or Aviation 460) in the summer, take 5 SH; others take 4 SH.
(4) Disciplinary majors require 2 electives (6 SH) more than Divisional majors.
(5) Depends on major selected and flight core scheduling.

ACADEMIC PROGRAM

The academic program, under the direction of the Dean of the Faculty, allows men and women cadets to acquire a broad education in the basic and engineering sciences and the social sciences and humanities. You will be required to complete a balanced sequence of prescribed courses in all of those areas. You must choose a major in one area and fulfill the requirements for a degree. Elective enrichment courses are offered to cadets who have the talents and interests to pursue further study.

The total academic curriculum is designed to develop future Air Force officers whose minds are innovative, analytical, and resourceful. Classroom instruction encourages you to communicate and express your ideas, thereby developing the intellectual traits of leadership. The enrichment program encourages you to develop your full academic potential and to acquire a background for possible graduate education during your future career.

After you complete basic cadet training, you will be enrolled in academic classes as a fourth classman. The same expectations of achievement and performance required of you during the summer training are carried over into academics. You must learn to budget your time and study regularly in order to accomplish the academic workload, which will seem extensive in comparison to your previous requirements in high school.

The curriculum of over 180 semester hours, including core courses and majors courses, is greater than the requirements of a civilian university. Academic courses are given during each fall and spring semester. Course descriptions and majors programs are included in the catalog appendix.

Academic Core Courses

During your fourth and third class years, you will concentrate on prescribed core courses. In later years your program will contain more options (majors courses). The standard sequence required of most cadets is shown in the Summary of the Core Curriculum. In a two-course sequence, the first course is offered in the fall semester and the second course in the spring. Single course offerings are split between fall and spring to help balance departmental workloads. Cadets with advanced standing will take some courses ahead of schedule.

Academic Majors

After spending two years taking a diversity of core courses, you will be prepared to select a major that suits your interests and aptitudes. Faculty advisors will explain the requirements of all majors. You may consult with an advisor and request assistance in choosing your major. You must make a selection before registering for the fall semester of your second class year. Most cadets, especially those who select science and engineering majors, will choose earlier. When you make a selection, you will be assigned an advisor to assist you in planning a course program for future semesters. You will take the remaining core courses along with those required for your major.

The following majors and minor are offered:

DISCIPLINARY MAJORS

Science and Engineering

Aeronautical Engineering
Astronautical Engineering
Biological Sciences
Chemistry
Civil Engineering
Computer Science
Electrical Engineering
Engineering Mechanics
Engineering Sciences
Mathematics
Physics

Social Sciences and Humanities

Behavioral Sciences
Economics
Geography
History
International Affairs
Management

DIVISIONAL MAJORS

Basic Sciences
Engineering
Humanities
Social Sciences

INTERDIVISIONAL MAJOR

Aviation Sciences

MINOR

Atmospheric Sciences (with Basic Sciences major or Physics major)

The Enrichment Program

Through the enrichment program, cadets may be placed in courses according to their individual ability, preparation and achievement. You are encouraged to participate in this program in any or all of the following ways:

Transfer Credit

Credit may be awarded for any college course satisfactorily completed which is equivalent to a course in the Academy curriculum. This allows you to substitute other courses for those omitted through transfer credit.

Validation

Special competence may have been gained through honors courses in high school, through College Board advanced placement tests or other experience that will enable you to complete validation examinations to satisfy the requirements for comparable Academy courses. You may choose a substitute elective for a course satisfactorily validated.

Acceleration

If you have special preparation or above average ability in a subject, you may be placed in accelerated courses which complete the requirements for a two-course sequence in one semester. Such courses are currently offered in chemistry and foreign languages.

Advanced Placement

Cadets who have special preparation or above average ability may also be placed in an advanced course of a multi-course sequence. Upon successful completion of the advanced course, you receive validation credit for prior courses in the sequence. Such placement is currently accomplished in core mathematics courses.

Substitution

Advanced course versions are offered as substitutes for some of the prescribed courses. They allow you to concentrate on a subject in greater depth or to satisfy requirements for a particular major.

Overload

Cadets who maintain a 2.60 grade point average may enroll in one course beyond the normal semester requirement. Cadets who maintain a 3.25 grade point average may enroll in two courses beyond the normal semester requirement. This allows you to have a wider latitude in your course selection.

Honors Courses

Many departments offer honors versions of core courses to selected cadets who volunteer. Course material is studied in greater depth than in the regular sections. Special notation is made on the transcripts of cadets who participate in honors courses.

Audit

First and second class cadets who maintain a 2.60 grade point average may audit one course beyond the normal semester requirement. However, you may not take an overload course in addition to an audit course. Cadets who maintain a 3.25 grade point average may audit one course and overload another course. You are not required to take examinations in these courses. Audited courses will not appear on transcripts.

Because of federal statutes the enrichment program does not allow a cadet to graduate in less than four years. The program, on the other hand, does encourage you to take additional courses in your major field of interest, or take diverse elective courses.

Individual initiative is encouraged through the enrichment program. A course entitled Independent Study, consisting of research work by cadets on topics of their own choosing, is offered to upperclassmen by each academic department. Term papers and laboratory experiments provide other opportunities for cadets to engage in their own research.

Every effort is made to keep the content of courses up to date and abreast of current developments. To cover contemporary topics or provide special courses requested by cadets, each academic department may offer a course entitled Special Topics. The content of these courses may change from semester to semester and may cover a wide range of topics.

Foreign Exchange Programs

The Air Force Academy currently has an exchange program with France, affording selected cadets the opportunity to learn more about the organization, philosophy, and operation of the French Academy.

Each fall semester, not more than ten cadets from the Air Force Academy exchange places with cadets from the Ecole de l'Air (French Air Force Academy). The program includes student participation in the academic, military and athletic activities of the host academy for the semester.

Some reciprocal visits are also made to the academies of other allied countries. For example, during each spring semester, not more than ten cadets from the Escuela de Aviacion Militar (Argentine Air Force Academy) come to the Air Force Academy for approximately 30 days. Air Force cadets reciprocate by visiting the Argentine Academy during the summer.

Foreign exchange programs are not currently open to women cadets because the foreign academies visited are not coeducational.

Interservice Academy Exchange Program

The Air Force Academy has exchange programs with the United States Military Academy and the United States Naval Academy. During one semester small groups of Air Force cadets attend West Point and Annapolis, while similar numbers of Naval midshipmen and Army cadets attend the Air Force Academy. The purpose of this exchange is to provide future military leaders with a better understanding of the other service academies and to develop a degree of uniformity among programs at the academies. The exchange program is available to both women and men cadets.

Graduate Education

The Air Force encourages Academy graduates to continue their education by attending civilian graduate schools. This may be accomplished in several ways such as winning a scholarship, being selected to participate in the Honor Graduate Program, or being chosen by the Air Force Institute of Technology for further education. An expanded description of these programs is included in the Air Force Career chapter of this catalog.

Accreditation

The Air Force Academy is a fully accredited institution of higher learning. The standard Bachelor of Science degree is accredited by the North Central Association of Colleges and Secondary Schools. The Engineers' Council for Professional Development, composed of representatives of the major professional engineering societies, has granted accreditation to the majors in Aeronautical Engineering, Astronautical Engineering, Civil Engineering, Electrical Engineering, Engineering Mechanics and Engineering Sciences. The Major in Chemistry fulfills the recommendations of the Committee on Professional Training of the American Chemical Society. Cadets who complete the requirements for one of these majors will earn a specified degree: for example, Bachelor of Science in Chemistry.

The Faculty

Academic courses of study are taught by a faculty composed primarily of Air Force officers. A few officers from the United States Army, Navy, and Marine Corps, and from the military forces of allied nations serve in a liaison capacity. The military faculty is supplemented by noted visiting lecturers from civilian colleges and universities.

Faculty members are required to hold master's degrees in their fields, and many have earned doctorates. A number of colleges and universities in the United States, as well as some foreign institutions of higher education, are represented in the backgrounds of the Academy faculty.

Twenty-one permanent professor positions and the Dean of the Faculty have been established by law. The permanent professors usually serve as department heads. The other academic ranks are tenure professor, tenure associate professor (on extended tours of duty), professor, associate professor, assistant professor, instructor, and lecturer.

Members of the Academy faculty have a responsibility beyond that of teaching their particular courses. They have an obligation to help furnish a continuing motivation for cadets to devote a career to the service of their country. They attempt to accomplish this goal through precept and example as career officers and qualified faculty members. In addition to maintaining close contact with the cadets in the classrooms and as course directors, faculty members serve as sponsors for their extracurricular activities.

Faculty members perform other functions such as participating in local and national meetings of educational and professional societies. Many of them have made contributions to the literature of their disciplines and to progress in their fields through research projects. During the summer, faculty members often serve other installations of the Air Force as consultants.

Personnel serving on the Academy faculty are listed in the appendix according to the faculty organization to which they are assigned.

An outline of the faculty organization is as follows:

Division of Basic Sciences
- Department of Chemical and Biological Sciences
- Department of Mathematical Sciences
- Department of Physics

Division of Engineering Sciences
- Department of Aeronautics
- Department of Astronautics and Computer Science
- Department of Civil Engineering, Engineering Mechanics and Materials
- Department of Electrical Engineering

Division of Humanities
- Department of English and Fine Arts
- Department of Foreign Languages
- Department of History

Division of Social Sciences
- Department of Economics, Geography and Management
- Department of Law
- Department of Behavioral Sciences and Leadership
- Department of Political Science and Philosophy

Counseling and Scheduling

Administration of the curriculum is the responsibility of the Directorate of Counseling and Scheduling. The directorate prepares the academic calendar, publishes the curriculum handbook, conducts registration, designs the course offering timetable, produces academic schedules, assigns classrooms, and schedules final examinations.

The directorate administers the academic counseling system and monitors the progress of academically deficient cadets. Over 300 officers in the various academic departments serve as advisors to provide guidance to cadets in the selection of core courses and majors. They also counsel cadets who have academic deficiencies or have been placed on academic probation.

Instructional Methods

Faculty members may employ the entire range of teaching techniques including lectures, discussions, demonstrations, tutorials and seminars. The small size of most Academy classes, usually 15 to 20 cadets, has made the discussion approach practical and popular. The classroom atmosphere is relaxed with free communication between the instructor and cadets. Extra instruction is provided for cadets who need assistance to develop their understanding of a subject and to improve their grades.

Academy prepared readings, notebooks, and laboratory guides as well as commercially published materials are used by the academic departments. Daily assignments, supplementary reading suggestions, and discussion questions are included in most of the materials.

Departments use a variety of testing techniques, ranging from essay questions and themes to short-answer and multiple-choice items. The nature of the subject matter determines the type of test used. Quizzes are given over class materials at the discretion of the individual instructor. Most departments permit the instructor to construct class tests so that a portion of the final grade will come from measuring instruments devised with total freedom by the instructor. In preparing graded reviews and final examinations, most departments use a committee composed of instructors.

Handheld Scientific Calculators

Handheld scientific calculators have replaced the slide rule as the standard calculation tool in all technical courses at the Academy. The new system is faster and more accurate than any other calculation means presently available with exception of the large computer. The type of electronic calculator selected by the Academy is suited to the needs of the cadet curriculum and to classroom conditions.

If you are an Academy candidate and do not own a calculator, the Academy recommends that you wait until you enter to purchase the standard model which will be provided at the time of initial textbook issue. The govern-

ment wholesale cost will be charged to your cadet pay account, unless you prefer to pay at the time of issue. A 12-month warranty period will be operational throughout your first year of academics.

If you receive an Academy appointment and already own a calculator, you may bring it when you enter the Academy if the calculator meets Academy specifications. The specifications will be included in an instruction booklet which is mailed to each appointee.

The use of an advanced programmable calculator is not recommended. The added computational capacity will be helpful only in certain technical majors in the second and first class years. If you have questions, write to the Department of Mathematical Sciences, USAF Academy CO 80840; or call 303-472-4470.

Colonel Robert J. Lochry, professor and head of the Department of Mathematical Sciences, is responsible for the innovation of calculators in cadet technical courses.

Instructional Technology

The Directorate of Instructional Technology provides audiovisual materials and training devices to support instruction in all departments. Among the support resources are libraries of films, slides and photographs. Graphics services are available for preparation of instructional materials and displays used in classrooms and laboratories. Various mock-ups are manufactured for lab experiments and demonstrations.

A closed circuit television system supplements live classroom instruction. The TV system is equipped to televise up to twelve simultaneous programs to any area in the academic building. Instructors can prepare live or video-taped programs using several multiple production methods. Academic skills courses in reading improvement and typing, noncredit requirements for all fourth class cadets, are taught mainly by televised presentations.

Classrooms and Laboratories

Cadet classrooms are located in Fairchild Hall, the large academic building. Most classrooms are designed to accommodate small class sessions to encourage discussion between students and instructors. Eight 40-person rooms and eight 76-person rooms are available when larger classrooms are appropriate to the instruction. These classrooms are in the shape of elongated horseshoes and tiered to provide maximum student-instructor contact. Five large lecture halls are available for assemblies of cadets and for staff and faculty meetings.

The Academy is well equipped with laboratories to supplement science and engineering classes. One of the most outstanding facilities is the Aeronautics Laboratory, housed in a separate building near Fairchild Hall. It is equipped with a subsonic wind tunnel, a supersonic wind tunnel, two shock tubes, and statically mounted jet and rocket engines. The Department of Aeronautics cosponsors, in conjunction with the Seiler Research Laboratory,

the operation of a 17-inch diameter low density shock tube which is the largest device of its kind in the world. The device is used in studying shock induced phenomena, high speed and high altitude instrumentation and certain astrogeophysical phenomena.

The Instrumentation Laboratory, in conjunction with NASA, is involved in studying the human cardiovascular system. Special instrumentation and techniques are developed to be used in measuring cardiovascular and circulatory parameters in the environment of both atmospheric and space flight.

A Radio Frequency Systems Laboratory is primarily concerned with instruction and research in radio systems and electromagnetic phenomena. The laboratory is equipped for experiments in guided electromagnetic waves, plane waves and radio communications. An antenna range on the laboratory roof is used for testing and developing types of antennas.

The Academy Planetarium is a unique multimedia education and research facility used for cadet instruction in astronomy, navigation and related academic disciplines. The Planetarium, with a seating capacity of 300, is used for educational demonstrations to school groups and the general public. The projector enables the instructor to simulate a multitude of realistic sky effects on the 50-foot hemispherical star theatre. Movements of stars, planets, comets, meteors and satellites can be duplicated for past, present or future time.

The Academy Observatory, housing a 10-inch telescope, is used by cadets in the study of astronomy.

The Education and Research Computer Center houses a large digital computer supporting remote and batch processing of research and course programs in numerous assembly and higher level programming languages. This center supports every academic discipline and is used by nearly one-half of the Cadet Wing each year as well as several hundred faculty members conducting research.

The Academy has two Foreign Language Laboratories with accommodations for 49 cadets each. The student sits in a sound proof cubicle and responds to the instructor's statements on a tape recorder. By playing back the tapes, the student is able to critique his progress in the language.

Seiler Research Laboratory

The Frank J. Seiler Research Laboratory (FJSRL) is the only basic research lab operated by the United States Air Force. It is named in memory of the late Colonel Frank J. Seiler, an Air Force research pioneer. The mission of FJSRL is two-fold: (1) to conduct research in chemistry, aerospace mechanics and applied mathematics and (2) to encourage and support Academy faculty and cadet research with a variety of resources. A resident staff of research scientists works closely with faculty members and cadets on Air Force projects of mutual interest. An inertial guidance lab and facilities for chemical synthesis and analysis are among the research equipment available for use by the FJSRL staff, the faculty and cadets.

The Seiler Research Laboratory is part of the Air Force Systems Command (AFSC). AFSC sponsors Air Force Academy research through FJSRL, which involves faculty members and cadets in summer programs.

AIR FORCE ACADEMY LIBRARY

The Air Force Academy Library serves the academic, research and recreational reading needs of the Academy. The library also maintains a growing collection of historical aeronautical materials. Many valuable donations from private collections have contributed to making the library a significant resource center for the history of flight.

The book and microfilm collection of the library is comprised of more than 420,000 volumes. Included in this number are subscriptions to more than 2,300 periodicals and 90 newspapers. The scientific and technical report literature includes a collection of more than 210,000 titles, with most of these available on microfiche.

Although the library's reference collection contains standard and specialized reference works in most subject areas, it also includes strong bibliographical collections for identification of research materials that are not held by the library. Such materials are normally obtained on interlibrary loan through use of the facilities of national and regional cooperating libraries and bibliographic centers.

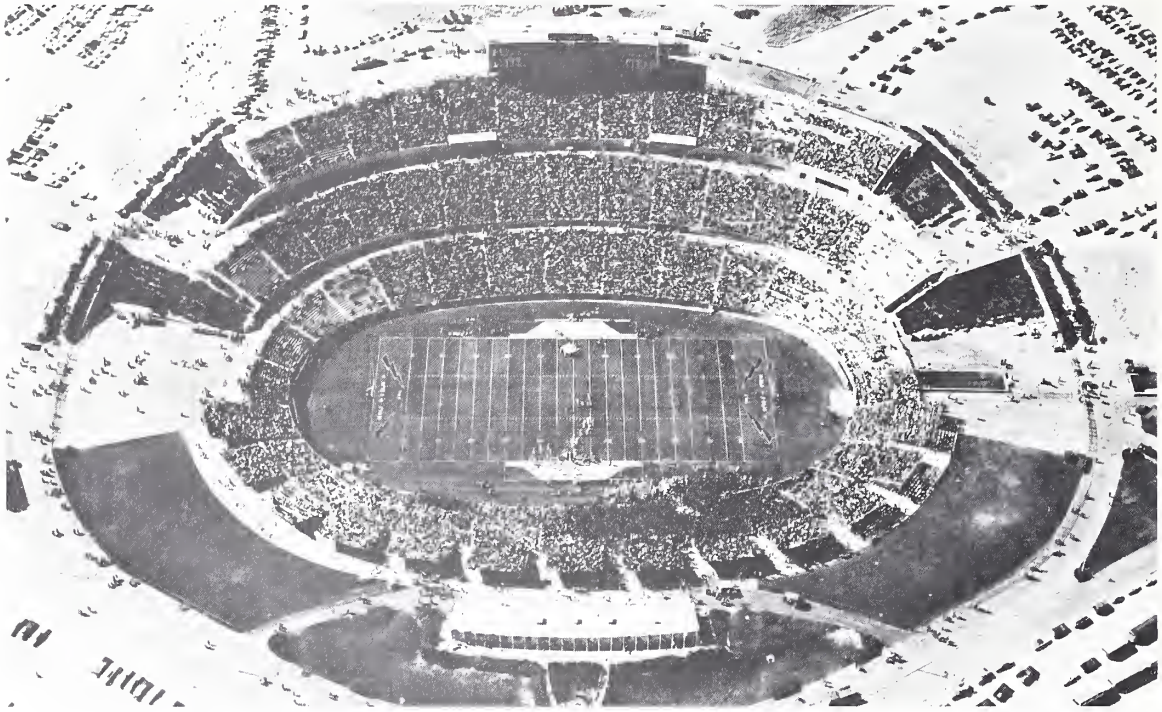
Specialized resource collections and facilities contribute to the excellent service that the library provides to the Academy community. Some of these are the current periodical and newspaper reading rooms, the reserve book room, the microfilm reading room, and the music listening rooms. The audio collection contains records and tapes of classical and contemporary music, drama, poetry, history, and other subjects.

A special collections branch houses complete archival records on the establishment and growth of the Academy as well as materials of historical significance regarding the growth and development of the Air Force. Some other essential resources are the collection of approximately 70,000 government documents, official records of the United Nations, and documents of other international agencies.

The library is an attractive, spacious, and modern facility located at the north end of Fairchild Hall, the academic building. All book stack areas are open to authorized library patrons to afford complete access to the library materials. A professional staff of librarians provides reference and research assistance to cadets and faculty. The assistance is available every day during approximately 90 hours per week that the library is open. The staff compiles selective bibliographies in many subject areas and listings of current acquisitions. They also conduct a complete orientation covering the library's collections, facilities, and services for all new cadets.

The Academy Library administers four branch libraries to serve specialized needs of the entire Air Force Academy community. These are: a Medical Library and a Patients' Library located in the Academy Hospital; the Law Library used both by cadets in their study of law and by military staff lawyers; and the Community Library equivalent to an Air Force base library. Over 40 smaller reference collections are located in various academic departments and staff agencies.

PHYSICAL EDUCATION AND ATHLETICS



The physical education and athletic program, conducted by the Director of Athletics, makes a vital contribution to your preparation for Air Force leadership. The purposes of the program are:

- To instill such attributes as skill, confidence, initiative and teamwork through competitive sports;
- To develop useful habits of physical fitness and conditioning;
- To develop courage, self control, and the ability to survive in emergencies;
- To acquire the athletic skills to instruct a variety of sports;
- To gain individual skills for enjoyment of sports after graduation.

The program involves instructional classes conducted by professional physical educators during each fall and spring semester. The instruction expands each year until you perfect your physical coordination, timing, aggressiveness and techniques. You will learn to participate in many types of sports through intramural contests. You may try for intercollegiate teams which are nationally known in many areas of varsity athletics.

The Academy's athletic facilities are considered to be among the finest in the nation. The Cadet Gymnasium has three full-sized gyms; one Olympic swimming pool and another 40-yard pool; courts for squash, handball, tennis, volleyball and basketball; and a rifle and pistol range. The Field House has an ice rink, a basketball court with seating for 6,600 spectators, and an indoor Tartan track with Astro-Turf infield for all-weather practice. There are 120 acres of outdoor playing fields.

PHYSICAL EDUCATION INSTRUCTION

The physical education program for men and women cadets is conducted primarily on a coeducational basis. In some cases separate training for men and women is provided to allow for the physiological differences. The physical education program for the four years is summarized as follows:

Fourth Class Year

Both men and women cadets undergo a vigorous training program designed to develop physical strength, endurance, agility, and coordination as well as a sense of teamwork and competition. All cadets will take a physical fitness test and a swimming test which require remedial instruction if performance is unsatisfactory. (It is important to learn to swim before entering the Academy. A distance of 500 feet in five minutes should be a minimum goal.) The summer training includes a progressive series of conditioning exercises and runs, sports activities, and inter-squadron field day. This training prepares you for the strenuous physical education and intramural requirements of the academic year.

During the fall and spring semesters, men cadets will begin to learn the fundamentals of self defense by taking boxing. Physical development and coordination are developed through gymnastics instruction for all cadets and fencing instruction for women only. Survival and recreation are emphasized in swimming classes for all cadets. You will take a classroom course in physical fitness methods which presents sound principles related to diet and weight control, aerobic conditioning, and building of muscular strength and endurance.

Third Class Year

Instruction in lifesaving will add to your confidence and capabilities in hazardous situations requiring advanced aquatic skills. Carry-over skills to enhance fitness and recreation are accentuated during the remainder of the curriculum. Wrestling instruction is provided for men only, and track and field for women only. In addition, you will receive instruction in two of the four following carry-over activities: tennis, golf, volleyball, handball (men only), and badminton (women only).

Second Class Year

Combatives instruction in judo for all cadets emphasizes aggressiveness, self confidence, and body development. Aquatic skills and self confidence are further developed by a course in survival swimming. You are exposed to several situations simulating aquatic disasters and emergencies which an Air Force officer may encounter. You are instructed in the two additional carry over activities not taken during the third class year.

First Class Year

The progressive development of carry-over skills is continued with your choice of two electives from the following: advanced tennis,

basic ice skating, advanced golf, basketball, diving, individual aerobics, and racquetball. In addition, you will take squash to add to your physical abilities and recreational enjoyment. To complete the instruction in self-defense, a course in unarmed combat exposes you to a multitude of potential hand-to-hand combative situations where you must react confidently, rapidly, and aggressively. Cadets who have not met minimum aquatic standards will receive additional swimming instruction.

INTRAMURAL PROGRAM

Intramurals are a vital part of the prescribed physical education program and the cadet way of life. Participation provides continued physical development and broad experience in both team and individual sports. Only those cadets engaged in intercollegiate sports are excused from competing in intramural athletics. An intense amount of pride and will-to-win is generated as each squadron in the Cadet Wing is represented by a team in every sport. During the fall, winter and spring sports seasons, squadrons compete for the Malanaphy Trophy which is presented at the end of the year to the squadron that achieves the best overall intramural record. The intramural program, which is managed by cadets, also serves as a laboratory for developing leadership. The cadets construct detailed administrative plans, coach teams, officiate contests, and solve the many problems relating to this large athletic structure. The integration of women cadets into the intramural program will be on a co-educational basis. In keeping with existing policies, the placement of women cadets on specific teams will be based on the interests of cadets and needs of the squadron.
The schedule of intramurals is as follows:

Fall: football, lacrosse, flickerball, tennis, and cross country

Winter: boxing, wrestling, water polo, handball, volleyball and squash

Spring: rugby, basketball, swimming, team handball, soccer, and cadet wing open boxing championships

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics provide a source of competition for a large number of cadets to participate in individual or team sports against colleges and universities. The intense competition builds spirit and pride throughout the Cadet Wing.

Individual men and women cadets and Academy teams recognized for outstanding achievements are provided the opportunity to compete in post-season bowl games and tournaments. Participation in such events reflects the competitive leadership traits desired in future military officers.

Eighteen intercollegiate sports are offered:

Fall — football, cross-country, soccer, water polo

Winter — basketball, fencing, gymnastics, swimming, wrestling, ice hockey, indoor track, rifle, pistol

Spring — baseball, golf, tennis, track, lacrosse

Women cadets who possess the talent can participate on intercollegiate teams with men cadets, except for the contact sports of football, wrestling, ice hockey and lacrosse. Separate women's intercollegiate teams will also be formed in a variety of sports. The Academy welcomes participation from women athletes.

The Academy's varsity teams compete with leading colleges and universities from all parts of the nation. The following 1976 football schedule is an example of the intersectional competition scheduled in all sports:

Home Games

Sep 11	Pacific
Sep 18	Iowa State
Oct 9	Navy
Oct 16	Colorado State
Oct 23	The Citadel
Nov 20	Wyoming

Away Games

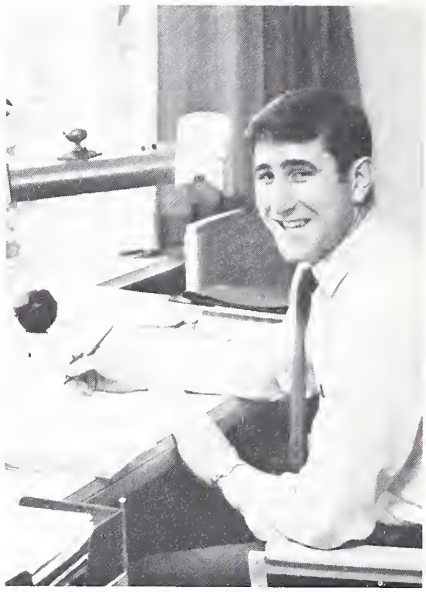
Sep 25	UCLA
Oct 2	Kent State
Oct 30	Army
Nov 6	Arizona State
Nov 13	Vanderbilt

All home games are played in Falcon Stadium located on the site of the Air Force Academy. The Air Force Academy Foundation, an organization of national civic leaders, raised funds to construct the stadium which has a seating capacity of approximately 50,000.

The Academy's intercollegiate athletic teams are known as "The Falcons." The Class of 1959, the first graduating class, selected the Falcon as the Cadet Wing Mascot and named it "Mach I," the term indicating the speed of sound. The falcon was chosen because its characteristics in flight are symbolic of the mission of the Air Force. Cadet Falconers, a group of cadets who train the mascots to fly in pursuit of lure, perform demonstrations during halftime activities at football games.

Intercollegiate athletics are financed primarily by the Air Force Academy Athletic Association, a self supporting and non-profit organization. The Athletic Association provides experienced coaching staffs and athletic equipment and maintains a central office at the Air Force Academy to handle the administrative details of intercollegiate athletics.

CADET LIFE



All aspects of cadet life add depth and meaning to the Academy and set it apart from civilian universities. Important features of cadet life are the military way you live, the leadership you demonstrate, the excellent facilities available to you, the comradeship you develop with other cadets, the unity and spirit you display, and the duty and honor you live by.

Your life is different from the average college student's in many ways. Your daily schedule is more exacting; your room and personal appearance must be immaculate; the pace you keep is more strenuous; your privileges and leaves are regulated; you cannot marry until after graduation; you cannot own an automobile until your first class year; and you have a limited pay allotment for personal expenditures. The intent of this arduous system is to produce a professional officer with the self-discipline to meet many challenges.

The Commandant of Cadets is responsible for supervision of most cadet life activities. These activities are administered by the Deputy Commandant for the Cadet Wing, who is assisted by Air Officers Commanding (AOCs) of the cadet groups and squadrons.

THE CADET WING

After you complete Basic Cadet Training, you are a member of the Air Force Academy Cadet Wing until graduation. When you are admitted to the wing, you are a fourth classman, equivalent to a freshman. In succeeding years, you will become a third classman (sophomore), a second classman (junior), and finally, a first classman (senior).

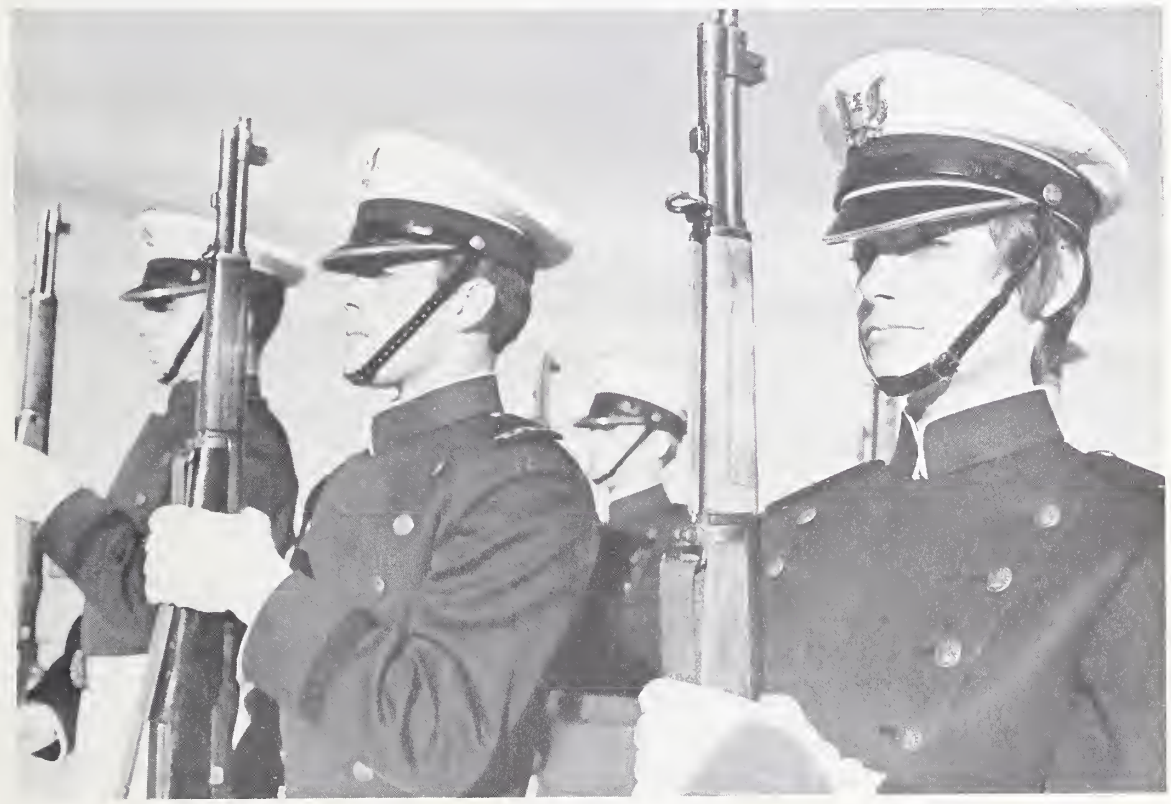
By public law, your commander in the Cadet Wing is the Commandant of Cadets, usually a Brigadier General. The Commandant grants authority for first class cadets to manage all units of the wing under the broad guidance of AOCs. The cadet organization consists of a Cadet Wing Commander and staff, along with commanders and staffs of cadet groups and squadrons. The wing is organized into four groups with ten squadrons each.

The wing is similar to an operational unit in the Air Force and serves as a leadership laboratory for cadets. Command and staff functions of the wing give you a chance to manage a military organization. Upperclass cadets in the wing gain leadership experiences by conducting the rigorous summer training programs for lower classes. These cadet cadres provide leadership through techniques of instruction, example, and participation. They are exposed to leadership authority, accountability, and performance.

First class cadets are cadet officers in the wing. The wing commander and the group commanders are cadet colonels; the squadron commanders are cadet lieutenant colonels. Cadet majors, captains, and lieutenants act as flight commanders and hold other operational and staff positions. Second and third class cadets may serve in positions as cadet noncommissioned officers. As a fourth class cadet you will not hold rank. You begin leadership development by learning to follow the commands of upperclass cadets.

Cadet Wing training is conducted on selected Saturday mornings for all cadets. A wide assortment of professional military subjects relevant to an Air Force career are included in this training which is required for graduation.

Within the structure of the wing, cadets may suggest changes of policy. New proposals are evaluated jointly by the Cadet Wing staff and the Commandant's staff of commissioned officers. As a military person, you must always remember, however, that rules and regulations sometimes run counter to individual desires. Although you may disagree with some policy, the Academy requires strict compliance on the part of all cadets. When there are practical benefits for both the Academy and the Cadet Wing, a policy or regulation can often be discussed and changed.



WOMEN IN THE CADET WING

Women cadets will be assigned to the same squadrons as men cadets, but women will live in a separate part of the dormitory. Women will be trained by upperclass cadets in the Cadet Wing. In addition, women will be trained by women Air Force officers acting as surrogate upperclass cadets. These young officers, who hold the rank of lieutenant and captain, are called Air Training Officers (ATOs). This title was used by men officers who performed the same function when the Academy was established. The ATOs will supervise and train women cadets in the dormitory environment. They will provide a role model for women cadets. The ATOs underwent several months of training to become qualified for this role.

CADET HONOR CODE

"We will not lie, steal, or cheat, nor tolerate among us anyone who does." These simple words provide the basis for a personal code of ethics designed to serve Academy graduates throughout a lifetime of service to their country. All candidates must be prepared to accept the Honor Code when they enter the Air Force Academy.

Immediately after entering the Academy, you will receive instruction in the Honor Code from elected cadet honor representatives of the first class. The instruction is given in an informal atmosphere where you are encouraged to ask questions and resolve any problems which might arise. After you are accepted into the Cadet Wing as a fourth class cadet, you must be prepared to live by the code.

The Honor Code is specific and clear in what it demands. You are expected to have complete integrity in both word and deed; you avoid quibbling or evasive statements; you do your own work in class. You are expected to report yourself for any Honor Code violation. You are also expected to confront any other cadet whom you believe has violated the code, or to assure that the incident is reported.

When you embrace this code, you are not setting an impossible standard for yourself. Adhering to the code will initially require self control and conscious effort on your part, but later this will become an ingrained habit and part of your total behavior. Although the code demands unqualified adherence, it does not place you on your honor to obey all orders and regulations or to report infractions of them. The code is a basic moral document covering only substantial matters of honor and integrity. By its very wording, the code sets its own boundaries.

The Honor Code is administered by elected senior cadets who have studied the code in depth and observed its implications and enforcement. After a thorough investigation of a possible violation and a finding of guilty at a cadet honor hearing, a cadet can be asked to resign from the Academy. In all of the proceedings, every possible step is taken to protect the rights of the accused.

Complementing the Cadet Honor Committee is a Cadet Professional Ethics Committee which seeks to instill high standards of ethical conduct in members of the Cadet Wing. Esprit, responsibility, loyalty, and integrity all enter into the professional ethics which this committee represents.

Being administered by and for the cadets, the Honor Code is an integral part of the Cadet Wing. Cadets regard this code as a minimum standard. In practice it is the foundation for a larger ethical code which serves the individual both as a cadet and as a future officer. Academy graduates regard the experience of living under the Honor Code as a cherished possession which helps them cope with the complex problems that face a career officer.

CADET SCHEDULE

During the academic year you will attend four fifty-minute classes or study periods each morning, followed by assembly for the noon meal formation. There are two periods of classes or study in the afternoon. Unless you participate in intercollegiate athletics, you will play on a squadron intramural team two afternoons a week after classes. The other three afternoons are spent in drill, extracurricular activities, or study. You may volunteer for additional academic instruction conducted during the hour immediately following the end of classes. After dinner you are required to study in your room or in the library. You must be in your room and in bed at taps, unless you have special permission to study late.

Typical Daily Schedule

6:00 — Reveille
6:50- 7:15 — Breakfast
7:30-12:00 — Classes or Study Periods
12:25 — Lunch Assembly
12:40- 1:05 — Lunch
1:20- 3:30 — Classes or Study Periods
4:00- 5:50 — Intramurals/Drill/Study
6:50- 7:15 — Dinner
8:15-11:00 — Study Period
11:00 — Taps

This schedule is for Monday through Friday during the fall and spring semesters. Saturday mornings are devoted to parades, inspections, administration, and training. Saturday afternoons and Sundays are basically free.

LEAVES AND PRIVILEGES

You are not permitted to have visitors or leave the Academy when you are a basic cadet. As a fourth class cadet, you are allowed visitors on Saturday afternoons and evenings and on Sunday mornings and afternoons. Cadets who are placed on restriction, for violations of major regulations, are not allowed visitor privileges. On certain occasions you are per-

mitted to dine out in the homes of Academy personnel. You will attend home football games and other scheduled events of the Cadet Wing. During the second semester, you may be allowed to leave the Academy on one or more weekends, but these privileges are limited.

When you become an upperclass cadet you will be allowed more freedom and privileges which will be gradually increased by class. As a third class cadet your privileges will still be limited, but when you become a first class cadet most weekends will be free if your performance is up to standard. When you have a weekend pass, you will normally be allowed to remain away from the Academy from your last military duty Saturday morning until Sunday evening study time.

Individual cadets may receive greater or fewer privileges than their class quota, depending on individual achievement or deficiency. If you are not performing satisfactorily in military training or academic studies, your privileges may be restricted. If you are doing above average work in all respects, your privileges may be increased.

Most cadets go to Denver, Colorado Springs, or Rocky Mountain recreation areas during privilege periods. As a fourth, third, and second class cadet, you are not permitted to own an automobile, but may rent or borrow one for privileges if you desire. If you have a weekend pass, you are encouraged to use the bus transportation service to and from Colorado Springs and Denver. As a first class cadet, you will be permitted to own a car and keep it at the Academy.

You will be granted approximately three weeks of leave each summer, except for your first summer as a basic cadet when you do not have leave. During each of your four years you will have approximately four days of leave for the Thanksgiving holidays, two weeks at Christmas, and one week during the spring. Emergency leave may be granted to you if an emergency involves a member of your immediate family. Other requests for special leave are considered on an individual basis.

COUNSELING AND ADVISING

During their first year at the Academy, some cadets have a difficult time making the adjustment from civilian to military life. At times during the entire four years, a cadet may have difficulty adjusting. If you should experience such problems, you will be encouraged to seek professional counseling. Many cadets have furthered their academic, military, or personal growth through professional assistance. The following personnel and organizations are involved in the Academy's total counseling program:

Air Officers Commanding (AOCs) are responsible for counseling cadets in their squadrons. Each squadron has an Air Officer Commanding and an Associate AOC. They will assist you in adjusting to the cadet way of life and are the primary point of contact between your parents and the Academy. They will monitor your progress, motivation, and attitude. As members of the Commandant's staff, they supervise the discipline system within squadrons and act as mediators when decisions are required. A squadron faculty officer is also available to counsel you in academic areas and to assist you with problems of academic deficiency or probation. Any of these officers will be available whether you simply need someone to talk to, or whether you seek more complete consultation or guidance.

The Cadet Counseling Center is a full time couseling facility which closely parallels a typical college counseling service. You will have access to the counselors and to materials and facilities available at the center. Objectives of the center are to assist you in gaining maximum personal satisfaction from cadet life and attaining the highest degree of academic success in your courses. The center will provide you with career information to assist you in making timely and realistic selections of initial Air Force career fields. You will be advised of personnel programs and policies which may affect your career goals.

Cadet Officers play a major role in guiding you. They are responsible for most of the

military training, academic tutoring, and athletic supervision within each squadron.

Academic Counseling and Scheduling advises you on course scheduling, majors programs, and scholarship opportunities.

Faculty Instructors are available to assist you in academic course work. They also help in selecting major academic fields and developing officer skills.

Cadet Chaplains offer counseling in personal, moral, and spiritual matters.

The Mental Health Clinic, under the Command Surgeon, offers complete psychiatric service.

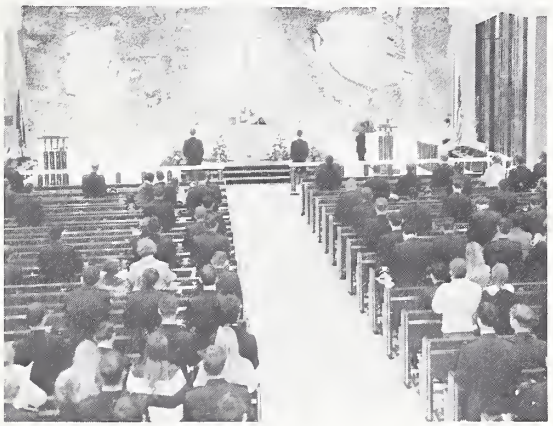
RELIGIOUS PROGRAM

The Cadet Chapel is the center of religious activity for the Cadet Wing. This unique structure, with 17 aluminum spires towering 150 feet, serves as a symbol of the Air Force Academy to the public. The stained glass columns separating each of the spires color the chapel interior with ever-changing hues. The chapel contains Protestant, Catholic, and Jewish worship areas and an All-Faith worship room.

Military leaders are responsible for upholding moral values among the men and women within their command. Participation in religious activities is therefore encouraged to develop leadership potential and individual spiritual growth. Participation is not required and attendance at services is optional.

You may participate in any of the following activities: Sunday or Sabbath worship services, daily morning and evening services, special denominational services and activities, cadet choir membership, Bible classes, religious discussion groups, and weekend retreats. Many cadets volunteer to teach Sunday school classes in local religious education programs. There are several cadet fellowship organizations with a large number of cadets participating, both on and off the base.

Religious services are conducted by Air Force Chaplains who are regularly ordained clergymen. In addition to the scheduled religious activities, the chaplains offer individual pastoral care and cadet counseling services. Guest ministers and lecturers are featured at the services periodically. Attendance at church services in local communities is permitted when cadets are free from duty.



MEDICAL SERVICES

The Academy has excellent, convenient medical facilities. A cadet dispensary in Fairchild Hall provides out-patient treatment and physical examinations. A cadet dental clinic in the south dormitory provides complete dental care, including orthodontia. The Academy Hospital, about two miles from the cadet area, is fully equipped and staffed with physicians and specialists. If you must be hospitalized, your academic studies may continue through a special program between the hospital and the academic faculty. If medically able, you will receive academic instruction either at your bedside or in a classroom in the hospital.

LEGAL SERVICES

The Academy provides confidential advice and assistance to cadets on personal legal matters. If you have any legal problems or need help in preparation of legal documents, the professional legal staff at the Academy will be available to you. The staff includes all officers assigned to the Department of Law and to the office of Staff Judge Advocate. The staff is not permitted to represent military clients in civilian courts.

CADET DORMITORIES

You will live in one of two large dormitories which are designed to house two or three cadets to a room. Women cadets will be housed in a separate section of one dormitory. The dormitories contain a post office, shoe repair shop, a cadet tailor shop, cadet banking facilities, barber shop and beauty shop. Each dormitory also contains a laundry and dry cleaning facility for cleaning cadet clothes under a government contract. There are squadron meeting rooms, recreation rooms, and cadet club activity rooms located throughout both dormitories. Located in Vandenberg Hall, the largest of the two dormitories, is a Cadet Store which stocks clothing, personal items, academic supplies, electronic equipment, sporting goods and gift items.

CADET DINING HALL

The cadet dining hall, containing more than one and one-half acres of unobstructed floor space, accommodates the entire Cadet Wing at one sitting. Three meals a day provide ample and nourishing food to sustain you in the vigorous programs of cadet activity.

One of the highlights of cadet life is the noon meal formation and the marching of the entire Cadet Wing to the dining hall. Either the Cadet Drum and Bugle Corps or the Academy Band plays for the event, which is viewed by visitors from an overlook north of the Chapel.

CADET UNIFORMS

Cadets wear a variety of uniform combinations, depending upon the occasion and the weather. During the academic year, they wear a classroom uniform. The class uniform for men is a blue shirt and trousers; for women it is a blue blouse with a skirt or slacks. The uniform is worn with a jacket in cool weather and with a parka in cold weather. A blue uniform for dress occasions is provided, with a skirt matching the jacket for women and trousers for men. Other uniforms are the mess dress for formal social functions, parade dress for formal ceremonies, and utility fatigues for field training.

Cadets of the upper three classes are permitted to wear civilian clothes when on leave or privileges. During the fall semester, fourth class cadets are not ordinarily permitted to wear civilian clothes. At the beginning of the spring semester, the Cadet Wing Commander may designate a date when fourth classmen may begin to wear civilian clothes on leave or privileges.

CADET BENEFITS

You will receive your education, room, meals, and medical care at government expense. A monthly allotment adequately covers the cost of uniforms, books, supplies, and personal needs. You are prohibited from accepting any other grant or scholarship aid, unless the donor allows you to use the financial assistance for personal expense only. Your pay and allowance are considered sufficient for you to be self-supporting, provided you are economical. The pay is not sufficient to cover any debts contracted prior to entrance, to send money home to your parents, or to spend for luxury entertainment or expensive personal items. The money is carefully allocated monthly to cover your obligations with a modest amount left for personal spending.

Included in the cadet budget is a provision for saving $1,000. This amount is furnished to you upon graduation so that you may purchase uniforms and meet other initial expenses as an officer. Additionally, the cadet budget contains provisions that allow those cadets who do not have sufficient funds available to obtain interest-free loans to cover any emergency situation.

Government-sponsored life insurance is provided at your option. You may obtain $5,000 to $20,000 coverage at $.85 per month per $5,000 coverage. A special commercial insurance plan is available to you on a voluntary basis. The plan provides $20,000 term life insurance for $3.25 per month, which is set aside from your monthly pay. This insurance policy may be carried forward after graduation.

CADET ACTIVITIES

Life at the Academy offers a wide choice of approximately 70 activities which the cadets have originated and continued on a voluntary participation basis. These activities enable you to develop your professional interests, creative talents, hobbies, and leadership potential. Some of the activities provide opportunities for competition with regional or national teams. Weekend trips are arranged in connection with some of the events. The organized activities for women and men cadets are as follows:

Cadet Wing Media

- Contrails Calendar Staff
- Dodo Newspaper Staff
- Polaris Yearbook Staff
- Talon Magazine Staff
- KAFA Cadet Radio Station

Mission Support Activities

- Big Brothers Club
- Bluebards Dramatic Society
- Cadet Aid to MIA Families
- Cadet Chorale
- Cadet Falconers
- Drum and Bugle Corps
- Interaction Club
- Photography Club
- Scout Club

Representative Competitive Activities

- Aviation Club
- Balloon Club
- Bowling Club
- Forensic Association
- Handball Club
- Judo Club
- Model Engineering Club
- Parachute Team
- Rifle Drill Team
- Rugby Football Club
- Skeet Club
- Soaring Club
- Squash Club
- Volleyball Club

Professional Activities

- American Institute of Aeronautics and Astronautics
- Astronautics Club
- Astronomy Club
- Biology Club
- Chemistry Club
- Civil Engineering Society
- Computer Science Club
- Ecology Club
- Economics and Management Club
- Foreign Language Club
- Forum
- Geography Club
- History Club
- Institute of Electrical and Electronic Engineers
- Mathematics Club
- Mechanics Club
- Navigation Club
- Physics Club
- Professional Studies Group
- Psychology Club

Recreational Activities

- Amateur Radio Club
- Archery Club
- Autosports Club
- Bridge Club
- Chess Club
- Film Club
- Fishing Club
- Hunting Club
- Karate Club
- Military Science Club
- Mountaineering Club
- Saddle Club
- Scale Model Club
- Scuba Club
- Ski Club
- Weightlifting Club

Committees and Councils

- Automobile Committee
- Class Councils
- Class Ring Committee
- Ethics Committee
- Fourth Class Training Committee
- Heritage Committee
- Honor Committee
- Public Relations Committee
- Wing Allied Arts Committee
- Wing Rally Committee

RECREATIONAL FACILITIES

Arnold Hall, the cadet social center, is a modern recreational complex which contains a variety of facilities. You and your guests may use these facilities when you have off-duty time. The 3,000-seat theater is used for movies, concerts, plays, special events, and appearances by nationally known entertainers, including contemporary stars who are popular among young people. Formal and informal cadet dances, receptions, and other social events are held in the large ballroom and two informal lounges. The center has a snack bar, a bowling alley, and rooms for television and games.

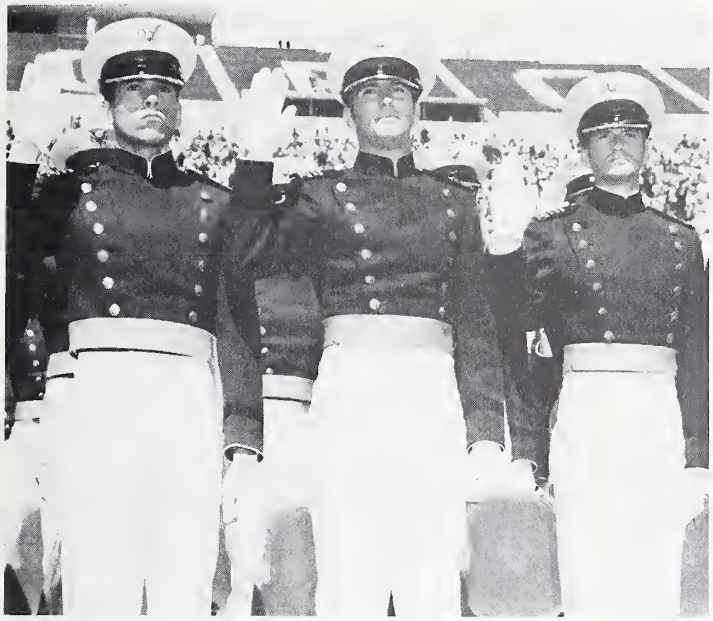
Functions are held in Arnold Hall on Friday and Saturday nights, evenings preceding holidays, and on other approved occasions.

The Academy provides two cadet recreational facilities surrounded by the natural beauty of the mountains. You and your guests may use these facilities when you have weekend privileges. The Lawrence Paul picnic area, located on a small lake within easy walking distance of the cadet area, is used for fishing, picnics and games. A cadet recreation lodge nearby has a snack bar, dining room, fireplace and dance floor. The Farish Memorial recreation area, situated on a lake in the mountains four miles west of the Academy, has accommodations for fishing, horseback riding, ice skating, boating, and barbecues.

The Field House and Cadet Gymnasium are available to enjoy during your leisure time. Adjoining these facilities are many outdoor playing fields for various activities. The beautiful Eisenhower Golf Course is available to all cadets who wish to play.

When you have privileges to leave the Academy on weekends, you can take advantage of many attractions in the Colorado Rocky Mountain region. Some of the finest skiing, hunting and fishing in the world are available in the scenic areas of the mountains. The cities of Denver and Colorado Springs offer many athletic facilities and events, music and drama programs, museums and art centers, parades and rodeos in Western style.

GRADUATION WEEK



The final achievement of cadet life is the day of your graduation from the Air Force Academy. During the week prior to graduation, the Academy holds Graduation Week activities honoring your class with parades and special events. This week has a special significance for members of all classes. *To the fourth class cadet,* it means recognition and upperclass status. *To the third class cadet,* it means advancement to positions of greater responsibility in the Cadet Wing and increased privileges. *To the second class cadet,* it means advancing in rank and position, receiving the class ring, and having permission to own an automobile. *To the first class cadet,* it means the pride in completing four active years along with the excitement of graduation events.

Among the highlights of Graduation Week are three award ceremonies recognizing individual cadets and units that have achieved scholastic, military, and athletic honors. Organizations and citizens who have a vital interest in the Air Force Academy sponsor the trophies and awards.

Important social occasions are held for all cadet classes in the social center. The outstanding social function for the first class is the formal graduation banquet and the colorful ball.

Graduation Week is climaxed by baccalaureate exercises, the graduation parade, and finally, the graduation exercises. Your family and friends, hopefully, will be present to see you graduate and to share your accomplishments with you. You will hear a distinguished guest speaker, receive your diploma for the Bachelor of Science degree, and take the oath of office for your commission in the Regular Air Force. The years you spent, which sometimes seemed long and difficult, may now appear short and memorable in retrospect.

Graduation will signify your completion of an extremely challenging task which tested your intellectual, physical, moral, and leadership abilities. Now that you have passed this supreme test, you are ready to serve your country and perform the duties of an officer for which you have been well prepared. You will report for duty after a vacation leave.

AIR FORCE CAREER

Officer Rank

When you graduate from the Air Force Academy, you will receive a commission as a second lieutenant in the Regular component of the United States Air Force. Under the agreement which you signed upon entering the Academy, you will have an obligation to serve as an officer in the Regular Air Force for five years. If you enter Air Force flying training when you graduate, you must serve for five years after completion of the training. Most graduates remain in the Air Force for a career.

Career Counseling

An extensive career information and counseling program is conducted to assist you in making a reasonable choice of your initial assignment and in formulating tentative long-range plans for your career. Outstanding officers from major Air Force organizations, representing the broad range of Air Force skills, meet with you to discuss career opportunities, flying and technical training, graduate education, and personal aspects of service life. Individual counseling is provided by the Cadet Career Information Office, your Air Officer Commanding, the Cadet Counseling Center, and other professional sources among Academy faculty and staff. The career discussions are particularly emphasized during your first and second class years so that you will have factual, current information concerning the Regular Air Force which you will soon enter as a professional officer.

Career Assignments

A great percentage of Academy graduates initially pursue a flying career. You may broaden your career horizons through qualification in flying skills. Holding an aeronautical rating will enable you to qualify for important staff and command responsibilities which require a flying background.

If qualified to fly, men cadets will be expected to enter flying training, either pilot or navigator, following graduation. Flying training involves approximately one year of instruction at an Air Training Command base. For cadets who plan to enter flying training, the Academy conducts both pilot and navigator indoctrination programs. These programs enable you to validate some of the basic courses in undergraduate flying training. After completing the undergraduate training and earning your wings, you will be scheduled for advanced training. As a pilot, you will specialize either in fighter, bomber, or transport aircraft. As a navigator, you will specialize either in electronic warfare or radar bombing.

Following completion of flying training, you can expect to be assigned to a combat operational unit or mission support unit for approximately five years. As Air Force requirements permit, you may then assume duties in another career area. Later in your career, you ordinarily will alternate between jobs relating to your flying specialty and those pertaining to another career area. However, the mission of the Air Force is to fly, and you must anticipate that a significant portion of your Air Force career will be in duties related to flying.

If you do not enter flying training, you will be assigned to a mission support career area. You will be allowed to specify your choice of a career area. Air Force requirements for personnel in that area, as well as your individual qualifications, will be taken into consideration when determining your initial assignment.

Women are currently prohibited from serving on duty in a combat career area (Title 10, U.S. Code). However, a test program is underway to determine how women pilots may be utilized in non-combat roles. Based on the results of this program, undergraduate pilot and navigator training may become available to qualified women graduates of the Academy.

Graduate Education

Graduates who rank in the top 15 percent of their class are designated as Honor Graduates. Future advanced education will be provided for each Honor Graduate, provided the individual performs at a high level as an Air Force officer. Selection of graduates and scheduled attendance will be consistent with individual career development and Air Force assignment policies. Graduates usually will be selected after three or four years in the service, and entry will not be later than eight years. Individual prefcrences for civilian graduate schools will be honored by the Air Force if possible. A graduate may apply for any advanced degree program if he or she is qualified and the Air Force has a valid requirement.

Cadets who have maintained outstanding grade averages may compete for distinguished graduate scholarships and fellowships. Included are the Rhodes Scholarships for advanced study at Oxford University, National Science Foundation Fellowships, and other selected national competitions. Academy graduates who receive advanced education through one of these awards may request flying training after completion of their graduate programs.

Legal and Medical Training

Limited opportunities are available for highly qualified Academy graduates to enter training for Air Force careers in law or medicine. The brief explanations below reflect present Air Force policy, which may be subject to change in future years.

Congress has authorized the Air Force to enter 25 active duty officers into law schools annually. An Academy graduate must complete two years of service after graduation before becoming eligible for consideration. Selection for law schools is on a competitive basis among all active duty officers who apply.

Academy graduates will be eligible to apply for medical training only after completing an initial service obligation as designated by the Air Force. Graduates with qualifying academic backgrounds will become eligible to apply for two medical programs currently available: (1) The Armed Forces Health Professions Scholarship Program, (2) The Uniformed Services University of the Health Sciences. Selection for these programs will be on a competitive basis among the applicants. Numbers of students will be based upon the needs of the Air Force.

Career Benefits

Advancement in the Air Force is somewhat similar to advancement in a civilian occupation. It depends upon length of service, qualifications, and performance. The pay scale is established by Congressional law. The officer is paid according to rank and length of service.

As you progress in rank, your advancement will be based increasingly upon your personal merit and initiative. The Air Force is a vastly technological and far-reaching organization, yet one that recognizes the value of the individual. The Air Force puts a high premium on leaders with vision, dedication and ability. It offers a stimulating challenge and an interesting future in a wide spectrum of fields to Academy graduates who employ their leadership talents.

Normally, you will be assigned during your career to one or more of the armed forces schools for advanced professional studies. These include the Air Force schools at Maxwell Air Force Base, Alabama (Squadron Officers School, Command and Staff College, and Air War College) and the Department of Defense schools (Armed Forces Staff College, Industrial College of the Armed Forces, and National War College).

You may have additional opportunities for advanced education. Career officers in the ranks of lieutenant through lieutenant colonel are eligible to apply for further education through the Air Force Institute of Technology (AFIT) at civilian colleges and universities. Selected officers attend on a full-time basis, receive pay and allowances, have their tuition and fixed fees paid, and receive some reimbursement for books and thesis expenses.

If you become a pilot or navigator, you will receive flight pay in addition to base pay. Both are taxed by the federal government. You will receive a tax-free allowance for subsistence, and an allowance for living quarters when not occupying government housing.

During your career you may have duty assignments both in the United States and overseas. Each time you move, you will obtain reimbursement for transportation costs, an extra allowance for incidental expenses of moving, and free shipment of household goods. On an average, an officer will move to a new assignment every three to five years.

Additional benefits which you receive are: medical and hospital expenses; commissary and base exchange privileges; officers club privileges; VA and FHA mortgage loan insurance; group life insurance; 30 days' paid vacation each year.

The government provides for retirement at no expense to the officer. You may retire at 20 years of service at 50% of base pay. Benefits increase proportionately to 75% of base pay at 30 years of service. You will contribute to Social Security and also receive those benefits when eligible.

A Regular officer in the armed services has excellent security prospects with stable employment, pay and benefits. The Academy is the Air Force's only program which provides a Regular commission upon graduation.

Women in the Air Force

The contributions made by women in the armed forces are not new. Women have long served in the Nurse Corps of the various services. During World War II, women served in the air forces as part of the Women's Army Corps (WAC), the Army Air Forces, and Women Air Service Pilots (WASPS).

These contributions were recognized by Congress when it passed the Women's Armed Forces Integration Act in 1949. This act recognized women as a prominent part of the Armed Forces and created the Women in the Air Force (WAF) as a segment of the United States Air Force.

Under today's equal personnel concepts, women are not organized as a separate corps, or referred to as WAFs, but form an integral part of the Air Force. They are trained and assigned under essentially the same policies as men, and they compete equally with men for promotions.

The Officer Training School and the Air Force Reserve Officer Training Corps (AFROTC) have been open to women for several years. One of the final achievements of integrating women into Air Force training programs was made possible on October 7, 1975, when President Ford signed into law the bill which authorized admission of women to the national service academies. The law states that the standards required for admission, training, graduation, and commissioning of women will be the same as those required for men, except for minimum adjustments in standards required because of physiological differences between men and women.

Career Obligations

A career in the United States Air Force entails certain obligations as well as benefits. You are expected to serve your country with serious purpose and dedication. You may be assigned to various areas of the world considered vital to the maintenance of national or international security or important to the scientific and technological advancement of mankind. Some of the areas may be underdeveloped or remote where living conditions are below standards to which you have been accustomed. Your family may not be permitted to accompany you on certain assignments. Under all conditions you will be expected to give your best efforts and provide exemplary leadership for those who serve under your command.

Association of Graduates

An Association of Graduates has been established at the Air Force Academy to maintain contact with the alumni. The purposes of the Association are as follows:

1. To promote interest and devotion to the Air Force Academy, its history, activities, and objectives;
2. To encourage worthy young men and women to apply for appointment to the Air Force Academy;
3. To foster fellowship among the graduates of the Air Force Academy in particular and among the United States armed forces officer corps in general;
4. To provide for continued professional development of the armed forces officer corps in support of the military profession;
5. To support other activities in the general interest of the Air Force Academy or the membership of the Association of Graduates.

The Association of Graduates maintains an Alumni Secretary within the Command Section of the Academy to create a central point of contact for all alumni matters. The Association is organized as a non-profit body under the management of an elected Board of Directors, with necessary operating funds collected in the form of yearly dues as well as gifts, donations and bequests.

From 1955 through 1975, the Academy has graduated 9,353 cadets.

1968 Academy graduate, Capt Carl Janssen, star of the first AFA win over West Point, 1965.

AIR FORCE OFFICER CAREER AREAS*

Operations

- †Pilot
- †Navigator
- Air Traffic Control
- Weapons Director
- †Missile Operations
- Space Systems
- Special Operations

Scientific and Development Engineering

- Weather
- Scientific
- Research and Development Management
- Development Engineering

System Program Management

Communications - Electronics

Computer Technology

Civil Engineering

Cartography

Logistics

- Missile Maintenance
- Aircraft Maintenance/Avionics
- Munitions
- Transportation
- Supply Services
- Fuels Management
- Supply Management
- Procurement Management
- Logistics Plans and Programs

Comptroller

- Financial
- Management Analysis

Personnel Resources Management

- Administration
- Personnel
- Manpower Management
- Education and Training

Audio - Visual

Information

Intelligence

Security Police

Special Investigations, and Counter Intelligence

International Politico-Military Affairs

Disaster Preparedness

*Only a portion of the career areas above will be available to Academy graduates for their initial assignments. Pilot and navigator fields will be open to graduates who are physically qualified for flying training. Graduates who do not enter flying training will be assigned to other career areas. Those areas available each year may vary, depending on the needs of the Air Force.

†Not available to women at this time. Air Force test programs are underway which may open these career areas to women at a later date.

AUTHORIZED STRENGTH of the Air Force Academy Cadet Wing

Congressional legislation provides for an authorized strength of 4,544 cadets. The authorized appointments at maximum strength for each nominating category are shown below. Cumulative appointments are the total number available, of which approximately one-fourth will enter each year. The other appointments are filled annually.

SOURCE OF NOMINATION	Authorized Appointments (Cumulative)
100 United States Senators (5 each)	500
435 United States Representatives (5 each)	2,175
Vice President	5
District of Columbia	5
Puerto Rico	6
Canal Zone	1
American Samoa	1
Guam	1
Virgin Islands	1
Children of Deceased or Disabled Veterans and Children of Persons in a Missing Status	65
Allied Students	
Republic of the Philippines	4
American Republics	20
	(Annual)
Presidential	100
Regular Components	85
Reserve Components	85
Honor Military and Naval Schools, AFROTC and AF Jr. ROTC	20
Sons of Medal of Honor Recipients	No Limit
Qualified Alternates	Number needed to fill the class

ADMISSIONS PROCEDURES

DEFINITIONS OF TERMS

Applicant — One who applies to a Member of Congress or other nominating authority requesting a nomination for appointment to the Air Force Academy.

Nomination — The naming of an applicant as a candidate by a nominating authority.

Nominee — An applicant who has obtained a nomination in a category authorized by law.

Candidate — A nominee whose name has been recorded by the Director of Cadet Admissions as being eligible to compete for an appointment.

Appointee — A qualified candidate who has been selected for admission.

Appointment — An offer of admission to a fully qualified candidate to one of the authorized vacancies.

Cadet — An appointee who has been admitted to the Academy and has taken the oath of allegiance.

ADMISSIONS GUIDE

You should carefully read the admissions information in this chapter. The following is a summary of the steps for Academy applicants and candidates:

1. Check the eligibility requirements to see if you are eligible for a nomination.
2. Contact your Air Force Academy Liaison Officer whose name may be obtained through your Liaison Officer Coordinator listed in this catalog.
3. During the spring of your junior year in high school, request a Precandidate Questionnaire from the Academy. Complete the questionnaire and return it.
4. Apply to both of your Senators and to your Congressional Representative requesting a nomination to the Academy.
5. Study the criteria for the other nominating categories and apply if you are eligible.
6. Register for and take the College Board Admissions Testing Program (ATP) or the American College Testing Program (ACT).
7. Complete the Medical Examination as scheduled by the Department of Defense Medical Examination Review Board.
8. Complete the Physical Aptitude Examination as scheduled by the Admissions Office.
9. Insure that all forms received with your candidate instructions are completed and returned promptly to the Admissions Office.

SELECTION SCHEDULE

Highly qualified candidates who have completed all requirements will be considered for early selection beginning in December and continuing through March. However, if your records are not complete, it will not be possible to consider you for an early appointment.

After the Academy receives the results of your tests, your qualifications will be evaluated and you will be notified of your status. If notified that you are below the admissions criteria, the deficiency will be explained and you may re-take the tests or take other necessary action to improve your status until 1 April.

Candidates who have not received early appointments will be considered in April if their records are complete. A complete record includes your official candidate nomination, test results, candidate documents, and liaison officer evaluation.

Candidates whose medical status has not been determined will be considered, but if selected the appointment would be conditional pending determination of medical qualification.

If your records are not complete by 1 April, you will be considered for an appointment at a later date only if a vacancy should occur and you are found qualified for admission. Since some initial appointees may decline their appointment offers, other qualified candi-

dates will be selected to fill those vacancies. In those cases, the replacement candidates may not be notified of appointments until shortly before the class enters late in June.

All candidates will be notified of their qualification status no later than May. If you do not receive an appointment to the Academy, you may be invited to compete for the Air Force Academy Preparatory School. If you meet the admissions criteria, you will receive a preparatory school application with your candidate status report. Information on the school is included in the Preparatory School description of the catalog.

ELIGIBILITY REQUIREMENTS

You must meet the general eligibility requirements specified by public law, as follows:

Age — You must be at least 17 and not have passed your 22nd birthday by 1 July of the year to be admitted.

Citizenship — You must be a citizen of the United States. (Allied students authorized admission are exempt from the U. S. citizenship requirement.)

Marital Status — You must be unmarried. (Any cadet who marries will be discharged from the Academy.)

If you meet these requirements, then you may proceed to request a Precandidate Questionnaire and apply for a nomination. Before you apply, you should determine that you have a desire to become a cadet and have an interest in serving as an Air Force officer. You should also decide that you are capable of competing for a cadet appointment on academic, medical and physical standards. The Preparation Guidance chapter of the catalog outlines a high school program to assist you in meeting the desired standards.

PRECANDIDATE EVALUATION

The Air Force Academy uses a precandidate system to evaluate the qualifications of applicants. The information is made available to Members of Congress who participate in this system to assist them in identifying and screening their nominees. You should request a Precandidate Questionnaire from the Academy when you reach the second semester of your junior year in high school, or as soon as possible thereafter, if you wish to enter the Academy immediately after graduation from high school. *Do not request the questionnaire prior to your junior year second semester.* Send your request to the Admissions Liaison Office, USAF Academy, CO 80840.

Complete the questionnaire and return it as soon as possible. The questionnaire will be evaluated and reports of the results will be sent to Members of Congress the first week in October, November, December and January. Your completed questionnaire must be received at the Academy no later than mid-December to insure inclusion in the final report.

Participation in the precandidate program does not mean that you are under consideration for admission to the Academy. Before you can be considered, you must obtain a nomination in one of the nominating categories.

ASSISTANCE TO APPLICANTS

The Air Force Academy provides counseling assistance to individuals who are interested in obtaining a nomination to the Academy. The counseling is provided primarily by selected Air Force Reserve officers, not on active duty, who are located in all states. Selected retired Air Force Reserve Officers also provide this service. These officers are qualified to counsel you on all aspects of admission, and through their close contacts with officials at the Academy, are able to discuss most aspects of cadet education and training.

The counselors are known as Air Force Academy Liaison Officers (LOs). When you begin to plan and prepare for the Academy in high school, it would be advisable at that time to contact the LO nearest to you. You will be required to see an LO if you become an official candidate. You may be able to obtain your LO's name and address from the guidance counselor at your high school. If it is not available, you may request this information by writing to the Liaison Officer Coordinator (LOC) in your area. A list of LOCs is included in the catalog appendix.

NOMINATING CATEGORIES

You must obtain a nomination in a category authorized by law before you can be considered for a cadet appointment. To increase your chances of being selected, you should request a nomination in all the categories in which you are eligible to apply. Your applications should be submitted during the year preceding admission according to the specific dates given under each nominating category. Sample application formats are included in the appendix of this catalog. They are to be used as a guide only. You should prepare your own letter of application based on the format.

The various nominating sources are explained below under the titles of Congressional Nominations, Other Nominating Authorities, and Competitive Categories.

Congressional Nominations

Any resident of one of the 50 states who meets the Academy eligibility requirements may apply for a Congressional nomination. You must submit your request directly to a Member of Congress representing you. United States Senators nominate from their respective states at large. Representatives in Congress nominate from their districts. You may apply to both of the United States Senators in your state and to the Representative of your Congressional district. Refer to the Congressional application format shown in the catalog appendix.

No political affiliation is necessary to apply for a nomination. Congressmen want to nominate outstanding individuals who will have a chance to qualify for an Air Force Academy appointment.

Since many Congressmen conduct interviews and tests before selecting their nominees, they prefer early applications. It is advisable to apply approximately a year in advance of admission. Congressmen submit names of their nominees to the Academy any time between 1 May and 31 January for the class entering the following summer. A majority of them will make their selections early in this period. Application deadlines are established by the individual Members of Congress with some having deadlines as early as 1 August.

An applicant who is selected for nomination will receive a notice from the Congressman. The Admissions Office will send official notification of a nominee's candidacy after the Congressman has submitted his nomination to the Academy. A considerable period of time may occur between the applicant's request for nomination, the selection and notification of nominees by the Congressman, and the candidate notification and instructions from the Admissions Office.

Each Senator and Representative is authorized to have a maximum of five cadets attending the Academy at one time. For each cadet vacancy that occurs, the Congressman may nominate a maximum of ten candidates to be considered for the appointment. If the Congressman does not have a cadet vacancy available, he will not nominate candidates during that year. Three primary methods of nomination are available to Congressional members:

1. *Principal/Alternate* — The Congressman may nominate one principal candidate and nine alternates listed in the order of his preference. If the principal candidate is determined to be fully qualified on Academy admissions criteria, he or she will be offered the appointment. If disqualified, the appointment will be offered to the first designated alternate candidate who is qualified.

2. *Principal/Competitive Alternate* — The Congressman may nominate one principal candidate and nine alternates without designated preference. If the principal candidate is fully qualified, he or she will be offered the appointment. If disqualified, the appointment will be offered to the alternate candidate who has the highest qualifying score.

3. *Competitive* — The Congressman submits the names of all candidates to the Academy for evaluation of their qualifications. The Academy ranks the candidates in order of their standing on all admissions criteria. The candidate who has the highest qualifying score will be offered the appointment.

Fully qualified candidates will have a chance to be selected for appointment even if they are not chosen to fill specific Congressional vacancies. These candidates will be considered as qualified alternates and chosen competitively to fill the available vacancies in that category.

Other Nominating Authorities

The same methods of nomination available to Members of Congress may be used by the following nominating authorities:

1. *Vice President* — The Vice President of the United States nominates candidates from the nation at large. Applications must be submitted to his office no later than 31 October. Refer to the Vice Presidential application format in the catalog appendix.
2. *District of Columbia* — The Delegate in Congress from the District of Columbia nominates from among the residents of the District.*
3. *Panama Canal Zone* — The Governor of the Panama Canal Zone nominates from among the children of civilians residing in the Canal Zone and children of civilian personnel of the United States Government and the Panama Canal Company residing in the Republic of Panama.*
4. *Commonwealth of Puerto Rico* — The Resident Commissioner nominates from among all the residents of Puerto Rico, and the Governor nominates natives of Puerto Rico.*

*The above nominating authorities must submit the names of their nominees to the Academy by 31 January. The Congressional application format can apply as a guide. The spring of the junior year in high school is the appropriate time to apply.

Competitive Categories

Appointments in the following competitive categories are awarded to the best qualified candidates within each group in order of merit.

1. *Presidential*

By law, vacancies allocated to the President of the United States have been reserved for children of career military personnel — enlisted, warrant, and commissioned — of the Air Force, Army, Navy, Marine Corps and Coast Guard (active, retired, or deceased). The child of a Regular or Reserve member of the armed forces is eligible if:

(1) the parent is on active duty (other than for training) and has served continuously on active duty for at least eight years; *or*

(2) the parent was retired with pay or was granted retired or retainer pay (children of Reservists retired while *not* on active duty status are ineligible); *or*

(3) the parent died after retiring with pay or after being granted retired or retainer pay (children of deceased Reservists who were retired while *not* on active duty status are ineligible).

Persons eligible under the Children of Deceased or Disabled Veterans category may not be considered in the Presidential category.

In order for an adopted child to qualify as a Presidential candidate, he or she must have been legally adopted before the fifteenth birthday or proceedings must have been started before that time. Proof of adoption should be submitted with the application.

To request a nomination in this category, the individual (not a parent) must submit an application to the Director of Cadet Admissions between 1 May and 31 January. Please do not apply directly to the President of the United States. Refer to the Presidential application format.

2. *Children of Deceased or Disabled Veterans; Children of Military or Civilian Personnel in a Missing Status*

The child of a deceased or disabled member of the armed forces is eligible if:

(1) the parent was killed in action or died of wounds or injuries received or diseases contracted in active service, or died from preexisting injury or diseases aggravated by active service; *or*

(2) the parent has a service-connected disability rated at not less than 100 percent resulting from wounds or injuries received or diseases contracted in active service, or resulting from preexisting injury or disease aggravated by active service.

The child of a parent who is in "Missing Status" is eligible if:

> the parent is a member of the armed services or a civilian employee in active government service who is officially carried or determined to be absent in a status of missing; missing in action; interred in a foreign country; captured, beleaguered, or besieged by a hostile force; or detained in a foreign country against his will.

To request a nomination in this category, an individual must submit an application to the Director of Cadet Admissions between 1 May and 31 January. Refer to formats of application in the appendix.

3. *Regular Components and Reserve Components*

Vacancies are available for enlisted members of Air Force Regular and Reserve components. Included in this category are Air Force Regular airmen on active duty and airmen serving in the Air Force Reserve and the Air National Guard.

AFR 53-10, "Appointment to the United States Air Force Academy" gives complete directions for applying in the Regular and Reserve categories. A prospective candidate must apply through the unit commander, who will process the application and forward it to the Director of Cadet Admissions for a determination of eligibility. The application form (AF Form 1786) should be obtained through normal publications supply channels at the military organization where the individual is assigned. Applications for both Regular and Reserve components must be submitted not later than 31 January.

4. *Honor Military and Naval Schools*

Vacancies are authorized for honor graduates of honor military and naval schools. The Departments of Air Force, Army and Navy determine annually which schools will be designated as honor schools. Each school may nominate five candidates from its honor graduates or prospective honor graduates to compete for the cadet vacancies. Each nomination must contain a certification by the head of the institution that the candidate was an honor graduate or is a prospective honor graduate during a year that the institution was designated an honor school. Application forms are provided by the Academy. Nominations must be submitted to the Director of Cadet Admissions by 31 January.

5. *Air Force Reserve Officer Training Corps*

Five students from each college or university AFROTC unit may be nominated to compete for the authorized vacancies. Students should apply to the Professor of Aerospace Studies who must certify that they meet the basic eligibility requirements. The Professor of Aerospace Studies will recommend to the president of the institution the best qualified applicants. The president will submit the nominations on a form provided by the Academy indicating his concurrence and the satisfactory academic standing of the nominees. The form must be sent to the Director of Cadet Admissions by 31 January.

6. *Air Force Junior Reserve Officer Training Corps*

Five students from each high school may be nominated to compete for the authorized vacancies. Students should apply to the Aerospace Education Instructor who must certify that they meet the basic eligibility requirements and by the end of the school year will have successfully completed the prescribed AFJROTC program and be awarded a certificate of completion and a high school diploma. The Aerospace Education Instructor will recommend to the principal of the high school the best qualified applicants. The principal will submit the nominations on a form provided by the Academy indicating his concurrence. The form must be sent to the Director of Cadet Admissions by 31 January.

7. *American Samoa, Guam, and the Virgin Islands*

American Samoa, Guam and the Virgin Islands are authorized to have one cadet each enrolled at the Academy at one time. When a

vacancy exists, the Governor of Samoa and the Delegates in Congress from Guam and the Virgin Islands may nominate ten candidates. Names of all nominees must be submitted to the Director of Cadet Admissions between 1 May and 31 January for the class entering in the summer. The Congressional application format also will apply to these authorities.

Children of Medal of Honor Recipients

The children of Medal of Honor recipients who served in any branch of the armed services may apply for a nomination in this category. If applicants meet the eligibility criteria and qualify on the entrance examinations, they will be appointed to the Academy. Vacancies are not limited in this category. Applicants must write to the Director of Cadet Admissions between 1 May and 31 January, using the sample letter in the appendix as a guide.

Qualified Alternate Candidates

The Air Force Academy Board may recommend qualified alternate candidates from all nominating categories in the number required to bring the Cadet Wing to its authorized strength. All qualified candidates will be considered on a competitive basis and no application by the individual is necessary.

Allied Students

The Air Force Academy may provide instruction to young persons from allied countries as follows:

Republic of the Philippines

One student from the Philippines may be admitted to the Academy each year. The President of the Republic of the Philippines will be responsible for selecting nominees to be considered for this appointment.

American Republics

As many as 20 citizens from American Republics may be enrolled at the Academy at one time. Not more than three persons from any country in the American Republics may be enrolled at the same time.

To request a nomination, applicants should write to an appropriate officer of their government, not to the Academy or other United States government officers. The letter should contain information about their background and should be submitted at least a year prior to admission.

Nominations should be received by 31 December for the class entering the following summer, but they should be submitted as early as possible.

Requirements for admission are essentially the same for allied students as for United States cadets. The College Board Admissions Testing Program or the American College Testing Program tests and the qualifying medical examination are required for allied students. Nominees who do not speak English as their primary language must take the English Comprehension Level Test.

Students selected for the Academy must be able to read, write and speak English proficiently. English language instruction will be provided for them during basic cadet training and the fourth class year. Semester schedules and curricular requirements may be adjusted by the office of the Dean of Faculty to allow for specific language and cultural differences.

Allied students receive the same pay and allowances as United States cadets. However, the allowance for initial travel to the Academy is not limited to mileage for travel within the United States.

If an allied student should be judged unable to profit by the academic courses, become deficient in conduct or aptitude for commissioned service, or commit an offense for which a United States cadet would be dismissed, the Department of the Air Force will be requested to withdraw the student from the Air Force Academy.

Each student who meets the established academic requirements for allied students will be awarded a Bachelor of Science degree. A student who does not meet the degree requirements will be awarded a Certificate of Completion. Allied students are not commissioned in the United States Air Force.

Previous Candidates

If you applied for the Air Force Academy in a previous year, and failed to receive an appointment, you may become a candidate again if you are successful in obtaining a new nomination. You should request a Precandidate Questionnaire by writing to the Admissions Liaison Office, USAF Academy CO 80840. The new questionnaire will enable you to submit your current scholastic test scores and to update your extracurricular activities. Reports on the questionnaires are made to Members of Congress. If you obtain a nomination, you will receive a candidate instruction booklet which contains specific information for previous candidates.

REQUIRED EXAMINATIONS

Medical Examination

You must take a thorough medical examination which measures physical and mental fitness for the strenuous cadet program. The examination also measures the medical qualifications for Air Force flying training. A majority of the candidates admitted must possess the qualifications for pilot or navigator flight training. The remaining candidates must fulfill the commission only standards. To qualify for a commission in the Air Force, without meeting flying standards, a person must have outstanding academic or leadership aptitudes. The medical qualification standards and examination requirements are listed in the catalog appendix. You should review this information thoroughly.

Medical examinations for all service academies are scheduled by the Department of Defense Medical Examination Review Board (DODMERB). A medical examination will be authorized only if an evaluation of the Precandidate Questionnaire indicates potential academic and leadership qualifications for admission. Examining facilities will not conduct an examination unless the applicant is scheduled by this board.

You will be notified by letter as to the date, time and place of your examination. If possible you will be scheduled at a government medical facility near your home. You should make every effort to meet the scheduled date. If unable to be present on that date, you must notify the Medical Examination Review Board and the medical examining facility.

The report of your medical examination will be forwarded to the Medical Examination Review Board for evaluation and certification. You will be notified of your medical qualification status. If you have met all medical standards, you will be fully qualified. If you are found disqualified for a non-remedial condition, no further testing will be authorized. If you have a remedial disqualification, you will be advised of the corrective measures required before a reexamination is scheduled. The medical examination will be honored by all U.S. service academies and ROTC programs. Therefore, a candidate will be scheduled for only one examination if applying for more than one service institution.

Any questions concerning a candidate's medical qualification must be referred to the Director of Air Force Standards, DODMERB, Box 3000, US Academy, Colorado 80840. Phone number (303) 472-3562.

Physical Aptitude Examination

You must take a Physical Aptitude Examination (PAE) consisting of four exercises designed to measure coordination, strength, endurance, speed and agility. You will be scheduled to take the PAE at an examining center as close as possible to your home. A list of test items is included in the appendix. Failure to attain a satisfactory score is disqualifying for admission. Therefore, you should be in good physical condition before taking the test.

The same Physical Aptitude Examination will be honored by both the Air Force Academy and the Military Academy. A candidate applying for both service academies will need to take the PAE only once. If the exam is administered by the Military Academy, it is the candidate's responsibility to have the results forwarded to the Admissions Office, USAF Academy CO 80840.

Scholastic Tests

All candidates for admission to the Air Force Academy must take either the College Board Admissions Testing Program (ATP) or the American College Testing Program (ACT). If you choose the College Board ATP, you will be required to take the Scholastic Aptitude Test (SAT) consisting of a verbal section and a mathematics section. You are encouraged, but not required, to take the College Board Achievement Tests. If you choose the American College Testing Program, you must take the entire ACT battery consisting of four tests: English, mathematics, social studies and natural sciences.

The tests are offered on several dates during the fall and winter months. You may take the tests any time they are offered but not later than February of the year of admission to the Academy. It is advisable to register for the tests even if you have not yet received an Academy nomination. This will eliminate the risk of being unable to register if you should receive a nomination after the closing date for test registration. It is also desirable to take the tests prior to the February date so you can retake them in an effort to improve on your original scores.

It will be your responsibility to register for the tests several weeks in advance each time you wish to take them. Most high school counselors will have the scheduled testing dates and instruction booklets published by the College Board Admission Testing Program and the American College Testing Program. The booklets will contain descriptive information on the tests and registration instructions. Mail your test registration and test fee to the appropriate testing program office. You will be scheduled to take the tests at the exam center you have chosen if the quotas have not been filled. Otherwise, you will be scheduled at another center as close as possible to your home. When you register for the tests, you must request that your scores be sent to the Air Force Academy.

If your guidance counselor does not have complete information on the ATP or ACT tests, you may write directly to the respective offices as follows:

Write to the College Entrance Examination Board office, either at Box 592, Princeton, N.J. 08540, or Box 1025, Berkeley, CA 94701. (Candidates who live in Montana, Wyoming, Colorado, Arkansas, Texas and states west should write to the California office; others should write to the New Jersey office.)

Write to the Registration Department, American College Testing Program, Box 414, Iowa City, Iowa 52240.

In order to compare your test scores with those of previous Academy candidates who won appointments, the following information is provided:

ATP	*Range*	*Mean Flying*	*Mean Non-flying*
Verbal Aptitude	450-800	550	596
Math Aptitude	500-800	640	682
ACT			
English	19-36	23	25
Social Studies	21-36	27	29
Mathematics	23-36	30	31
Natural Sciences	22-36	30	31

You may benefit by taking one or both of these testing programs in your high school junior year. Then if you become an Academy candidate you may improve on previous scores by retaking the tests in your senior year.

EVALUATION AND SELECTION OF CANDIDATES

Selection panels, comprised of senior officers assigned to the Academy, evaluate candidate qualifications. Their evaluations are derived from entrance examination scores, ratings on prior academic and leadership performance, and certain recommendations.

The selection panels recommend qualified candidates to fill the available cadet vacancies in each nominating category. The recommendations are presented for approval to the Academy Board, composed of the Superintendent and his key staff officers. The appoint-

ment recommendations are subject to final approval of the Secretary of the Air Force.

Candidates who hold principal nominations, as well as certain highly qualified alternate candidates, may be notified of their appointments as soon as they meet all entrance requirements. Early notifications will begin in December and continue on a weekly basis until May. Since a few selected candidates may decline their appointment offers, it is possible that some qualified candidates may not be notified of appointments until shortly before the new class enters in late June.

REQUIREMENTS OF CADET APPOINTEES

Documentary Requirements

Social Security Number

If you do not have a social security number, you should apply for one prior to admission. The application form may be obtained from the local Post Office or the Social Security Administration Office. Ask for Treasury Department Form SS-5.

Transcripts and Activities Record

You will be required to submit your entire scholastic record in secondary school and in preparatory school or college if you have attended. High school students are required to submit their current rank in class. You will be required to submit an activities record outlining your high school extracurricular performance or other activities which indicate leadership potential. All of these documents are used to evaluate your aptitude and capability for success as an Academy cadet.

Birth Certificate or Proof of Citizenship

If you receive an appointment, you must submit a certificate of birth, or proof of citizenship if you were foreign born or naturalized. U.S. citizenship is required unless applying as an allied student. A candidate who is adopted, claiming eligibility in a nominating category through an adoptive parent, must submit a copy of the court order of adoption.

Admission Deposit

Each appointee will be requested to deposit $300 at the time of admission to the Academy. The deposit will be collected during initial processing. The amount will be credited to your cadet pay account and will be used to help defray the cost of uniforms and other personal expenses that will be incurred immediately upon admission. The deposit should be made in the form of a cashier's check or money order, with your name on it, made payable to the Accounting and Finance Office. USAF Academy, CO 80840.

In a case of extreme hardship, this deposit may be reduced. A request for waiver should contain full justification. An appointee who is unable to make a full deposit will receive reduced money allowances until the account reaches the level as prescribed for the class.

The $300 entrance deposit is supplemented by authorization of the Secretary of the Air Force to advance a maximum of $600 to each cadet upon admission to the Academy. This advance becomes an extension of credit when your cumulative earnings are exceeded by your cumulative indebtedness and will be extended only for the purchase of initial clothing and equipment. The advance must be repaid during the time you are in training. The repayment is accomplished by recouping from the portion of your monthly pay not required for books, clothing, income tax, social security and other required items of expense. Recoupment continues until the advance is repaid.

Cadets who are involuntarily separated from the Academy prior to repayment of the advance will have all excess pay and allowances applied against the indebtedness. If the indebtedness is not satisfied by such application of funds, the cadets are permitted to turn in enough clothing and equipment of a distinctive military nature to liquidate the remaining balance. Cadets who are voluntarily separated for their own convenience are required to pay in full the amount of such indebtedness.

Travel Expenses

Appointees will receive instructions concerning fiscal allowances for travel to the Academy. Travel allowances will be credited to your personal checking account. Appointees who refuse to take the Oath of Allegiance upon arrival at the Academy, or appointees who are disqualified from accepting the Oath because of some fault of their own, will not be entitled to any travel allowances.

SERVICE OBLIGATIONS

The service obligations apply to all cadets except allied students from foreign nations.

Oath of Allegiance — When you process into the Academy, you will be asked to take the following Oath of Allegiance:

> "I, _____ (*name*), having been appointed an Air Force cadet in the United States Air Force, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies, foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter. So Help Me God."

Service Agreement: After you have taken the oath, you will be required to sign an agreement, with the consent of your parents or guardian if a minor, that you will fulfill the following service obligations:

Complete the course of instruction at the Academy (unless you are disenrolled by competent authority).

Accept an appointment and serve as a commissioned officer in the Regular Air Force for at least five years after graduation.

If authorized to resign from the Regular component before the sixth anniversary of your graduation, serve as an officer in the Reserve component until the sixth anniversary.

Service Understanding: You will be required to sign a Statement of Understanding which involves the following conditions set forth in Title 10 of the U.S. Code:

A cadet who enters the Academy from the Regular or Reserve component of any service, if discharged from the Academy prior to graduation, will normally revert to former rank and branch of service for the completion of any prior service obligations.

A cadet who enters the Academy from civilian life will assume a six-year legal obligation to serve in the Air Force, either active or reserve. If discharged from the Academy prior to graduation (either through action taken by the Academy or upon approval of a cadet's request to resign) the person will be subject to current Air Force Policy.

Discharge Policy: The policy requiring discharged cadets to serve in the Air Force may vary, depending on manpower needs of the Department of Defense. The current Air Force policy is as follows:

> *Fourth and Third Class Cadets* who are separated by the Academy or whose resignations are accepted will ordinarily be completely relieved from all military duty, active or reserve.
>
> *Second and First Class Cadets* who are separated or whose resignations are accepted will retain an active duty commitment (except for those separated for physical disability, unfitness, or unsuitability for further service). First and second class cadets will normally be transferred to the Air Force Reserve and ordered to active duty in an enlisted airman status. A second class cadet may be ordered to active duty for not more than two years, effective with the beginning of the second class fall semester. A first class cadet may be ordered to active duty for not more than three years. When separation occurs as a result of deficiencies which are not considered willful, the active duty provision may be waived.

Resignation Policy: A cadet who submits a request to resign will be required to state a specific request for the action. Appropriate procedures will be established for a determination of each case by the Academy Board, composed of the Superintendent and designated senior officers of the Academy.

PREPARATION GUIDANCE

HIGH SCHOOL PROGRAM

It is important to start preparing for the Academy well in advance of admission. Academic, leadership and physical preparation may even begin on the junior high school level. In senior high, you should definitely follow the program of preparation outlined in this chapter.

You should learn how to study effectively and budget your time to an advantage, for this is expected of every cadet at the Academy. To be successful, a cadet must give maximum effort to the curriculum of academic studies, military instruction and physical education.

High school counselors and Air Force Academy Liaison Officers may provide helpful assistance to students who are preparing and applying for the Academy. One of the most important things for you to know is *when* to apply. If you want to enter immediately after graduation from high school, as most cadets do, you must apply well in advance. It is advisable to apply for a Congressional nomination during the spring of your junior year. Members of Congress may submit their nominations from May through January for the cadet class entering the following summer. Since most Congressmen nominate their candidates well in advance of the 31 January deadline set for submitting nominations to the Academy, individuals who apply early usually stand a better chance of receiving a nomination.

Senators and Representatives are interested in nominating the student who has excelled academically in high school, who has demonstrated leadership potential through school activities, who is physically fit, who is liked and respected by associates, and who has a desire to pursue a military career.

Students not successful in obtaining an appointment to enter following high school

graduation may try for the Academy class entering the following year. The Academy encourages unsuccessful candidates to attend a preparatory school or a civilian college or university during the intervening year. The Academy does not recommend specific schools for preparation. Any accredited institution of higher education which offers a broad curriculum in the sciences, social sciences and humanities should provide adequate preparation.

Academic Preparation

An Academy candidate is required to take either the College Board Admissions Testing Program (ATP) or the American College Testing Program (ACT). These tests measure potential for success in the cadet academic program of the Academy. You are advised to take one or both of these testing programs in your high school junior year. If your scores are low in certain areas, you will have time to improve through further counseling and study. When you retake the tests as a candidate in your senior year, your scores may show considerable improvement. If your scores are high when you take the tests as a junior, you will not be required to retake the tests, although you may do so if you choose.

At the beginning of your junior year, you should obtain the ATP and/or ACT testing dates through your school counselor. It is your responsibility to register for the tests. The College Board conducts a Preliminary Scholastic Aptitude Test which provides excellent preparation and experience for the ATP tests. It is given in October each year.

To obtain the proper background for the ATP or ACT tests, and for the academic program at the Academy, you should definitely take the following subjects in high school and strive for above average grades:

English: Four years, including literature, composition, grammar, communication, and reading skills. A college preparatory course in written composition during your junior or senior year is especially recommended.

Mathematics: Four years, including algebra, geometry, trigonometry, and college preparatory mathematics.

Basic Sciences: Standard courses in physics and chemistry to include laboratory work. Additional courses in the sciences are desirable.

Social Sciences: A standard course in American History. Additional courses in history, economics, government, and geography are helpful.

A course in typing is recommended since cadets have many reports and themes to prepare. Typewriters are available to cadets.

Each cadet is required to take one foreign language, either Arabic, German, Chinese, Japanese, Spanish, French or Russian. A high school background in one of these languages is helpful. The student who has an opportunity to take a language in high school should select one language and take as much instruction in it as possible. Two or three years of instruction are considered desirable. Either Russian or German is appropriate for cadets who may desire to major in the sciences.

The Academy does not require specific school courses or credits for admission. A candidate does not have to be a high school graduate to gain admittance. However, anyone who has not graduated from high school at the time of entering may lack the proper background to accomplish the program of education. You should try to achieve the highest possible grades in your high school courses. A majority of the cadets have ranked in the top quarter of their graduating classes.

College credits may be transferred to the Academy if the courses correspond to those in the cadet curriculum and an acceptable grade level has been achieved. Cadets who have successfully completed college level high school courses, or those who have acquired extensive knowledge of a subject without taking a course, may take validation examinations after admission in an effort to obtain credit for comparable Academy prescribed courses. Placement/validation examinations are administered to each new cadet in the following subjects: English,

history, geography, chemistry, mathematics, political science, and foreign language.

Cadets who have made high scores on College Board Advanced Placement tests may receive validation credit for comparable Academy courses. If you have taken advanced placement courses in high school you are advised to take the related advanced placement tests. These tests are administered in May of each year at College Board examining centers throughout the country. Registration in advance, including payment of fee, is necessary. Information on registration procedures, fees, testing dates, and examining centers is contained in the bulletin, *Advanced Placement Examinations,* available without charge. This bulletin may be obtained by writing to the College Board Advanced Placement Examinations at one of the following addresses: Box 592, Princeton, N.J. 08540, or Box 1025, Berkeley, Calif. 94701.

A cadet who demonstrates acceptable achievement in a subject through college transfer credit or validation examination will be allowed to complete the comparable Academy course at an accelerated rate or to omit the course and take an appropriate substitute. No matter how many courses cadets may validate or transfer, they must enter as a fourth classman and spend four years at the Academy.

Students preparing for the Academy should plan to transfer credit or validate courses whenever possible. Cadets who have done so will be able to complete prescribed courses sooner, thus leaving more time in their schedule to gain depth in a subject area or prepare for post graduate study. Many Academy graduates will have opportunities for advanced study at civilian universities or Air Force schools.

Leadership Preparation

All phases of the Academy curriculum are devoted to preparing the cadet for leadership in the Air Force. Active participation in high school extracurricular activities provides valuable experience in preparing for positions of leadership responsibility. You should participate in extracurricular activities, both athletic and non-athletic. Examples of activities considered as evidence of leadership potential are:

1. Class officers or student government.
2. Participation and achievement in athletics (football, baseball, basketball, track and other sports).
3. Cheerleader or drill team.
4. Meritorious awards in academic or leadership activities (Citizenship Award, Boys' or Girls' State or Nation, National Honor Society.)
5. Participation and achievement in public speaking, debate, dramatics, publications, musical activities, and clubs.
6. Participation and achievement in the Scouts, Civil Air Patrol, or Reserve Officer Training Corps.

Consideration is given to candidates who are prevented from extracurricular participation due to work requirements for family assistance.

Physical Preparation

Physical fitness is essential if a cadet is to succeed at the Academy. Many studies have shown that there is a definite correlation between physical fitness and the ability to succeed in the programs of education and training.

A Physical Aptitude Examination (PAE) is given to candidates to measure their coordination, strength, endurance and agility. You should prepare for this examination by engaging regularly in vigorous physical activity such as running, exercises and sports, as well as practicing the specific skills of the PAE.

You should attempt to be in the best physical condition possible when you arrive for admission to the Academy. This will involve taking proper care of your health and building up your physical strength and endurance. Your first two months at the Academy will be devoted to a strenuous program of Basic Cadet Training. Physical exertion is required from morning until night as you go through the summer program. To be properly conditioned for the physical demands that will be placed

upon you, it is strongly recommended that you prepare in advance through the following athletic activities:

1. Participate in vigorous competitive team sports such as baseball, basketball, football and track.
2. Participate in individual sports requiring sustained physical effort such as swimming, tennis, handball, squash, boxing, judo and wrestling.
3. Perform strenuous conditioning exercises until many repetitions of each exercise can be accomplished without undue physical strain. Push-ups, pull-ups, sit-ups and other exercises which emphasize upper body strength and endurance are recommended.
4. Perform distance running regularly. Two-mile runs are recommended with alternate running and walking at first and gradually increasing the amount of running.
5. Learn to swim well to prepare for the aquatics portion of physical education. A distance of 500 feet in five minutes should be a minimum goal. Practice basic swimming skills: floating, front crawl, and side stroke.

PREPARATORY SCHOLARSHIPS

Three non-profit agencies, the Falcon Foundation, the Gertrude Skelly Trust, and the General Henry H. Arnold Educational Fund, provide educational assistance programs to enable deserving candidates to better qualify for admission to the Air Force Academy. These agencies have no official connection with the United States Air Force or the Air Force Academy. Neither do they have any connection with the Air Force Academy Foundation which raises funds to provide recreational and cultural facilities for the Academy.

The Falcon Foundation

The Falcon Foundation provides preparatory scholarships annually for highly motivated and qualified candidates seeking admission to the Academy and a career in the Air Force. The scholarships are awarded through preparatory schools to students who need additional academic preparation.

The Foundation makes annual cash grants for these scholarships to specific preparatory schools in various parts of the nation. Application for scholarships and information concerning the schools should be made directly to the Falcon Foundation, Post Office Box 67606, Los Angeles, CA 90067. Completed applications must be received by the Falcon Foundation by 1 May each year.

The Gertrude Skelly Trust

The late Gertrude Skelly of Tulsa, Oklahoma, established this trust fund. Scholarships from the fund will be awarded only to children, adopted children or step-children of active, retired, or deceased career members of the armed forces of the United States. A person should not apply unless a parent was or is a career member of the armed forces. Complete information on applications may be obtained by writing to The Gertrude Skelly Trust Fund, Post Office Box 1349, Tulsa, Oklahoma 74101. Completed applications must be received by 1 May each year.

The General Henry H. Arnold Educational Fund

Sponsored by the Air Force Aid Society, this fund provides educational assistance to children of Air Force personnel. Assistance is limited to college and preparatory schools beyond the high school level. Applicants may make their own choice of an accredited school. An application blank may be requested from: Director, Air Force Aid Society, National Headquarters, Washington, D.C. 20333. An application blank is not available at Aid Society sections on Air Force installations. The completed application, including qualifications and need for financial assistance, must be returned to the Air Force Aid Society not later than 31 January preceding the fall of the year the applicant plans to enter a civilian college or preparatory school.

THE ACADEMY PREPARATORY SCHOOL

The Air Force Academy conducts a Preparatory School located approximately five miles south of the Cadet Area. The school is a self-contained complex including classrooms, dormitories, a dining hall, gymnasium, athletic fields, and a parade ground.

Prep School instruction is divided into four areas: English, mathematics, military training, and physical training. A class of approximately 250 students enters early in August and completes the instruction the following May. Prep School graduates selected for cadet appointments enter the Academy around 1 July.

A portion of the Prep School class is composed of eligible Air Force enlisted men and women. Other vacancies in the class are filled by selected men and women candidates who were not offered appointments to the Air Force Academy. Students must be at least 17 and not over 21 years old as of 1 July of the year they enter Prep School.

Military Personnel: Appointments to the Air Force Academy are available each year for enlisted members of the Air Force Regular and Reserve components. Included in this category are Air Force Regular airmen on active duty and airmen serving in the Air Force Reserve and the Air National Guard.

Air Force personnel who want to attend the Preparatory School prior to entering the Academy may apply under AFR 53-14 "Air Force Academy Preparatory School." AF Form 1786 is the application form for requesting both a nomination to the Academy and an appointment to Prep School. You must fill out this form and submit it to your unit commander, who will forward the form along with a statement of recommendation to the Academy. All applications must reach the Director of Cadet Admissions at the Academy prior to 31 May.

Members of the Army, Navy and Marine Corps are not eligible to apply for an Academy nomination under the Air Force Regular and Reserve categories. Members of these services who want to enter the Air Force Academy may apply for a nomination from a Member of Congress. If a nomination is obtained from a Congressman or other authorized nomination source, enlisted personnel will then be eligible to be considered for the Academy Prep School.

Consideration for Prep School is based on your high school academic record, extracurricular activities, military performance, and the results of your scholastic and medical examinations.

Civilian Candidates: Certain Academy candidates who were not offered cadet appointments will be given opportunity to compete for selection to the Prep School. Candidates invited to apply are those whose records indicate that they have the potential for the Academy, but need additional academic preparation to improve their chances for admission. Candidates who have attended college or another preparatory school are not eligible.

It is not necessary for Academy candidates to initiate applications for the Prep School. The records of each candidate not selected for an Academy appointment will automatically be reviewed. If you are eligible to compete for a Prep School appointment, you will be notified in late April or early May. Candidates selected to attend the school must be willing to join the Air Force Reserve for a six year commitment. If eliminated from the Prep school or from the Academy, you must fulfill the remainder of the Reserve commitment. In event of a national emergency, you would be subject to recall to active duty.

Selection for the Preparatory School, or completion of the course, does not guarantee you an appointment to the Academy. You must meet qualifying standards and compete for appointment with other candidates.

High school students should not request admission to the Prep School prior to making application for the Academy. Prep School appointees require an Academy nomination and an invitation to attend the school.

QUESTIONS AND ANSWERS

Air Force Academy admissions procedures are not complicated, but an applicant must follow the requirements specifically as outlined in the Admissions and Preparation chapters of this catalog. To provide assistance to the applicant in understanding the most important facts, the questions that previous applicants have most frequently asked are given below with appropriate answers.

Q. Who can become a cadet?

A. Admission is open to young men and women of good moral character without regard to race, creed or national origin. Candidates must be citizens of the United States (unless applying as an allied student from the American Republics or the Philippines). A candidate must be unmarried and must be at least 17 years of age and not past the 22nd birthday on 1 July of the year of admission.

Q. I don't know my Congressman or Senators. How can I get a nomination?

A. It is not necessary to know them personally. Apply to your Congressional Representative and to both of your Senators by mail, following the application format in this catalog. Each Member of Congress is authorized to have five appointees attending the Academy at any one time. Each Congressman is permitted to nominate up to ten candidates for each vacancy he or she has. Nominations are made primarily on the basis of merit as evidenced by school records and tests. If you receive a nomination but are not selected to fill the Congressman's vacancy you will still have a chance to become a cadet if you meet the qualifications. Each year a number of the best qualified alternate Congressional nominees are appointed to bring the entering class up to authorized strength.

Q. When should I apply for a Congressional nomination?

A. The application process begins approximately a year before you want to enter. A class enters in the early summer each year. First, you should write to the Academy to request a Precandidate Questionnaire. To enter in the summer after you graduate from high school, write during the spring of your junior year or the early summer. If you are a senior or have already graduated, you should follow the same timing of at least a year in advance. Along with the Precandidate Questionnaire the Academy will send you an Admissions Bulletin explaining the nomination categories. You should apply for a nomination in one or more of the categories authorized by law. 85% of the authorized nominations are allotted to Members of Congress.

Q. I am in college now. Is it too late to enter the Academy?

A. Not as long as you would not be past your 22nd birthday on 1 July of the year of admission. But you must remain at the Academy for four years even though you have had previous college credit.

Q. My father was in the armed forces. Will this help me to get a nomination?

A. Children of career members of regular and reserve forces who are on active duty or who are retired may apply under the Presidential category. They may also apply for a Congressional nomination.

Q. If I received a nomination but failed to receive an appointment, am I eligible to apply for the Academy again?

A. Yes, but you must obtain a new nomination to become a candidate again.

Q. Can I apply for the Air Force Academy Preparatory School if I don't receive an appointment to the Academy?

A. An Academy candidate who fails to receive an appointment will automatically be evaluated for possible admission to the Prep School. If the criteria is met, an invitation to apply for admission will accompany the candidate status notice in May. If selected for the Prep School, a candidate must be willing to enlist in the Air Force Reserve for six years.

Q. Do the admissions tests count a great deal in selection of candidates for Academy appointments?

A. Each candidate is required to take either the College Board Admissions Testing Program or the American College Testing Program. The results of these tests do weigh heavily in the Academy's overall evaluation of a candidate. Because the scores are important, it is advisable to take one of these testing programs in your junior year in high school. This will indicate your scholastic qualifications and enable you to prepare additionally if your scores are not high enough. After you become a candidate, you can retake the tests in your senior year.

Q. How do I go about taking these tests?

A. See your guidance counselor to obtain registration instructions. It is your responsibility to register for the tests and to have your scores forwarded to the Air Force Academy.

Q. I have nominations to both West Point and the Air Force Academy. Is it necessary that I take two medical examinations?

A. No, a Service Academy Medical Examination is acceptable for all service academies.

Q. What part of the medical examination gives the most difficulty to candidates?

A. The eye examination. A majority of men candidates admitted to the Air Force Academy must be flying qualified. Pilot qualifications require 20/20 vision uncorrected by glasses. Navigator qualifications require 20/70 or better vision corrected to 20/20 by glasses. Candidates who are not pilot or navigator qualified will be considered for admission if they have outstanding academic or leadership aptitudes. To be considered, the refractive error must not be excessive and vision must be correctable to 20/20 with glasses.

Q. If I qualify to be a pilot am I required to take pilot training?

A. It is not mandatory, but a majority of the pilot-qualified cadets are expected to enter pilot training following graduation from the Academy. There are other career areas open to Academy graduates who do not qualify for flying.

Q. What is my military service obligation on graduation?

A. The total military service obligation of an Academy graduate is six years. Current directives require five of these to be on active duty as an officer in the Air Force following graduation.

Q. What if I cannot make the required grades at the Academy?

A. In that case you would be dismissed for deficiency. The Academy gives cadets opportunities to receive additional academic instruction in an effort to improve grades and avoid dismissal, if possible.

Q. How can I prepare for the Air Force Academy to improve my chances of receiving a nomination and an appointment.

A. You will be assured of the most adequate preparation if you start on the junior high level to acquire an adequate background in English and mathematics. Continue

your preparation in senior high with intensive English and math courses and take additional courses to enhance your preparation such as: physics, biology, chemistry, foreign language, history, government, and geography. Completing other basic courses in the sciences, social sciences and humanities will be helpful.

Q. Do I have to be an "A" student to get into the Academy?

A. No. But you should strive to obtain the best possible grades and to rank high in your class scholastically.

Q. Will it help my chances if I participate in sports and other extracurricular activities?

A. Yes, definitely. A student should seek to develop the personal traits which will cultivate leadership in school and community activities. The Academy evaluates leadership potential by a candidate's record of extracurricular activities, or in lieu of those activities, the jobs he or she has held are considered.

Q. What are the admissions opportunities at the Air Force Academy for members of minority groups?

A. The Academy is making an extensive effort to contact minority group students who otherwise might not apply for admission. Adequate preparation for the Academy admissions exams and other criteria are vitally important. If you need special assistance or advice on preparation, write to the Minority Affairs Division of the Admissions Liaison Office, USAF Academy, Colorado 80840.

Q. Is there any special advice for women to help them in preparing for the Academy?

A. Both men and women candidates are selected on the basis of academic achievement, leadership potential, and physical abilities. Women must participate in the same type of strenuous program as men cadets. Therefore, women should not neglect their physical preparation which will prove vitally important to overall success at the Academy. Women should also prepare for the extensive math and science courses required in the academic core curriculum to the same degree that they prepare for the English and humanities courses. Women should also note the academic majors offered and recognize that some of the traditional subjects of interest to women are not available.

Q. What can women do to prepare for the Academy's physical aptitude examination?

A. The development of upper body strength is very important. Cross country runs, swimming, push-ups, chin-ups, and flexed arm hang are important conditioning activities. You may ask your physical education instructor for advice on additional exercises.

Q. What reasons are given most frequently by cadets who resign from the Academy within a year after they enter?

A. (1) They were not sufficiently motivated for the demands of military life.
(2) They came to the Academy primarily because their parents wanted them to attend a service academy, and not because they were personally motivated.
(3) They realized that the military and academic programs were demanding, but they failed to understand the extent of the duties and pressure involved. Some were expecting more of a relaxed, college-type AFROTC program than the discipline of a service academy.

Q. Will my parents need to send money to me while I am a cadet?

A. No, the pay and allowances are considered sufficient for your self-support, provided you are economical in personal expenditures. Tuition, room and board, medical and dental care are provided. In addition, cadets receive monthly pay, for uniforms, books, and personal needs. This money is carefully budgeted for the cadet.

APPENDIX

GUIDE TO CONTENTS

LIAISON OFFICER COORDINATORS

Liaison Officer Coordinators are Air Force Reserve Officers, not on active duty, who act as admissions counselors for the Air Force Academy. Anyone interested in receiving counseling assistance should write or call the nearest Liaison Officer Coordinator.

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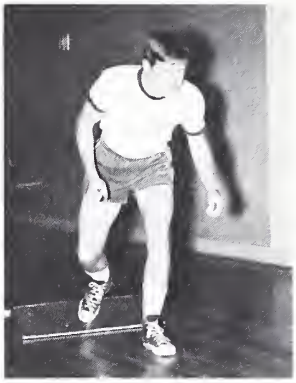
PHYSICAL APTITUDE EXAMINATION ITEMS

Candidates are advised to prepare for this exam by engaging in vigorous physical activities and by practicing on specific items. The items included in this examination are listed below. Women candidates will substitute the flexed arm hang for the pull-ups.

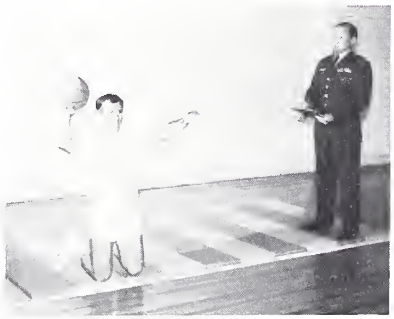
PULL-UPS (Men) — From a momentary straightarm hang position on a horizontal bar, palms away from face, elevate the body until the chin is above the bar. Return to the straight-arm hang position and repeat as many times as possible.

FLEXED ARM HANG (Women) — You are positioned by means of an elevating device (step ladder, platform, etc.) so that your chin is above the bar, elbows are flexed, and chest is close to the bar. Use an overhand grasp, palms away from body, and maintain a chin-above-bar position as long as possible.



300 *YARD SHUTTLE RUN* — Run six round trips between two turning lines, 25 yards apart, in the shortest time possible.

STANDING LONG JUMP — From a standing position behind a take-off line, jump forward as far as possible. Swinging arms, bending knees, and raising heels off the floor is allowed but do not take a preliminary step or hop.



BASKETBALL THROW — From a kneeling position on a mat, throw basketball overhead to attain as great a distance as possible. Three throws are allowed from behind throwing line.

MEDICAL EXAMINATION REQUIREMENTS

An individual's medical qualification for appointment to the service academies is determined through one general standardized examination used by all academies. Examinations are conducted at designated examining centers located throughout the United States and at some overseas bases. To be considered as a final qualifying examination it must be taken on or after 1 June of the year preceding the year of admission. Therefore, individuals who are not selected for admission must reaccomplish portions of the medical examination should they become candidates in succeeding years.

The examining facility will not make a determination of the candidate's qualification for admission. Examination results will be forwarded for review by the Department of Defense Medical Examination Review Board (DODMERB). Its final determination regarding medical qualification will be furnished to the Academy, which will notify the candidate and the nominating authority.

In order to reach an appropriate decision the reviewing authority may ask the candidate to supply further reports of specialty consultation to clarify the significance of certain items of medical history or examination findings. Final qualification also may be withheld pending receipt by the Board of Certification that certain disqualifying remedial defects have been corrected. Such reports and certifications should be forwarded to the Board as soon as possible, and in no case later than 15 March.

Before taking the qualifying medical examination, Academy applicants should review their past and present medical history with the assistance of their parents and family physician. The medical history must be compiled by the examining facility with particular care and full elaboration of details. Complete documentation of all illnesses, injuries and operations is absolutely necessary. The applicant may avoid delay in evaluation of the medical qualification by obtaining statements from the attending physician or from hospital records concerning any past or present medical care and presenting them to the examining facility when reporting for the examination.

Applicants are encouraged to undergo a thorough dental examination by their private dentist. All decay revealed visually or by x-ray should be filled at the applicant's expense before taking the qualifying medical examination. Final qualification will be delayed pending certification that such treatment has been completed.

Applicants who wear contact lenses must remove them a minimum of 21 days prior to the medical examination.

Women will be required to have a pelvic examination and a Pap test which may be completed by a family physician.

MEDICAL HISTORY

The following list of medical conditions is a guide for review by applicants and their parents in recalling the full medical history. The list is not all inclusive, and it should not be taken as a guide to all conditions which may or may not be disqualifying to admission. Each case is evaluated individually within established standards.

Rheumatic fever; swollen or painful joints; bone, joint or other deformity; painful or "trick" shoulder or elbow; paralysis or lameness; worn a brace or back support; "trick" or locked knee; arthritis or rheumatism.

Frequent or severe headache; dizziness or fainting spells; ear, nose or throat trouble; sinusitis, hay fever, or asthma; frequent or painful urination; kidney stone or blood in urine; sugar or albumin in urine; bed wetting; shortness of breath; pain or pressure in chest; palpitation or pounding heart; high or low blood pressure.

History of any surgical procedure; frequent indigestion; stomach, liver or intestinal trouble; gall bladder trouble or gall stones; stuttering or stammering; frequent trouble sleeping; sleepwalking; frequent or terrifying nightmares; depression or excessive worry; nervous trouble; head injuries with or without unconsciousness; loss of memory or amnesia; epilepsy or any type of seizures; tuberculosis; jaundice; goiter, tumor, growth, cyst or cancer.

Carious teeth, defective restorations, defective prosthesis, until corrected. Severe malocclusion or malrelation of the jaws. Orthodontic appliances in place for continued treatment. *(Retainer appliances are permissible if all orthodontic treatment is completed.)* Any dental defect that interferes with clear speech.

MEDICAL STANDARDS

A majority of candidates admitted to the Air Force Academy must meet the established standards for flying training (pilot or navigator). The remaining candidates must meet the medical standards for a commission in the United States Air Force at the time of graduation. Each applicant's report of medical examination is evaluated carefully on an individual basis, and no list of standards can cover all cases. However, those standards which apply to the greatest number of applicants are outlined below.

PILOT

Visual Acuity — Distant: Not less than 20/20, uncorrected, each eye. Near: Not less than 20/20, uncorrected, each eye.

Refractive Error — Not greater than −0.25 or +1.75 in any meridian nor an astigmatic correction greater than 0.75 diopters in any one meridian *(i.e., strength of lenses required to give the best possible corrected vision).*

Hearing — Maximum hearing loss cannot be greater than as follows: (ISO Standards 1964)
Each ear:

Frequency	500	1000	2000	3000	4000	5000
Loss	25	25	25	*	*	*

*No more than an average of 45 decibel loss for both ears at each frequency.

Weight — Must be proportionate to height and age.

Standing Height — Not greater than 76 inches nor less than 64 inches.

Sitting Height — Not greater than 38½ inches (*measured while sitting erect — the distance from the top of the head to the chair seat*).

NAVIGATOR

Visual Acuity — Distant: Not less than 20/70 uncorrected each eye; must be corrected to 20/20. Near: Not less than 20/20 uncorrected each eye.

Refractive Error — Not greater than +3.00 or −1.50 diopters in any one meridian nor astigmatism greater than 2.00 diopters in any meridian (*i.e., strength of lenses required to give the best possible corrected vision*).

Height, Sitting Height, Weight, Hearing — Same as pilot standards.

COMMISSION

Visual Acuity — Distant: Not less than 20/400 corrected to at least 20/20 in each eye. Near: Corrected vision of at least 20/20 in each eye.

Refractive Error — Not greater than +8.00 diopters or —5.50 diopters in any one meridian nor an astigmatic correction greater than 2.00 diopters in any meridian (*i.e., strength of lenses required to give the best possible corrected vision*).

Eye Muscle Balance — No tropia.

Hearing — Same as pilot standards.

Commission Height-Weight Standards

The weight standards below ordinarily will not be waived. However, exception to the standards may be granted if a generally large bone structure and large, well proportioned muscle masses without evidence of thick fat layers accounting for the excess weight.

MEN			WOMEN		
HEIGHT	WEIGHT		HEIGHT	WEIGHT	
Inches	*Minimum*	*Maximum*	*Inches*	*Minimum*	*Maximum*
60	100	146	60	92	124
61	102	149	61	95	127
62	103	151	62	97	128
63	104	155	63	100	132
64	105	159	64	103	135
65	106	163	65	106	138
66	107	166	66	108	141
67	111	171	67	111	145
68	115	176	68	114	150
69	119	181	69	117	154
70	123	186	70	119	158
71	127	191	71	122	162
72	131	196	72	125	167
73	135	201	73	128	171
74	139	206	74	130	175
75	143	211	75	133	179
76	147	216	76	136	184
77	151	221	77	139	188
78	153	226	78	141	192
79	157	231	79	144	196
80	161	236	80	147	201

FORMAT

Request for Congressional Nomination

Date .....

The Honorable .....
House of Representatives
Washington, D.C. 20515

Dear Mr. .....:

OR

The Honorable .....
United States Senate
Washington, D.C. 20510

Dear Senator .....:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I respectfully request that I be considered as one of your nominees for the class that enters the Academy in June 1977 and submit the following data:

Name: *(print as recorded on birth certificate)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

.....

Permanent phone number and area code: .....

Current phone number and area code: .....

Name of father: .....Name of mother: .....

Date and place of birth *(spell out month)*: .....

.....

Name and address of high school: .....

Date of graduation: .....Approximate grade average: .....

Furnish scores if you have taken tests:

PSAT	ATP (SAT)	ACT
Verbal _____	Verbal Apt _____	English _____
Math _____	Math Apt _____	Math _____

Extracurricular activities (Include athletic and non-athletic activities and work experience): .....

.....

State your reasons for wanting to enter the Air Force Academy: .....

.....

I (have) (have not) received a prospective candidate questionnaire from the Air Force Academy.

I will greatly appreciate your consideration of my request for a nomination to the Air Force Academy.

Sincerely,

Signature .....

FORMAT

Request for Vice Presidential Nomination

Date.....

The Vice President
United States Senate
Washington, D.C. 20501

Dear Mr. Vice President:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I respectfully request that I be considered as one of your nominees for the class that enters the Academy in June 1977 and submit the following data:

Name: *(print as recorded on birth certificate)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

Permanent phone number and area code: .....

Current phone number and area code: .....

Name of father: .....Name of mother: .....

Date and place of birth *(spell out month)*: .....

.....

Name and address of high school: .....

Date of graduation: .....Approximate grade average: .....

Extracurricular activities (Include athletic and non-athletic activities and work experience): .....

.....

State your reasons for wanting to enter the Air Force Academy: .....

.....

I (have) (have not) received a prospective candidate questionnaire from the Air Force Academy.

I will greatly appreciate your consideration of my request for a nomination to the Air Force Academy.

Sincerely,

Signature .....

FORMAT

Request for Presidential Nomination

Director of Cadet Admissions
USAF Academy, Colorado 80840

Date .....

Dear Sir:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I respectfully request that I be considered as one of your nominees for the class that enters the Academy in June 1977 and submit the following data:

Name: *(print as shown on birth certificate; if different from the name you use, attach a copy of court order, if applicable)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

Permanent phone number and area code: .....

Current phone number and area code: .....

Date and place of birth: *(spell out month)* .....

.....

Date of high school graduation: .....

If member of military *(list your rank, social security number, regular or reserve component, branch of service, and organizational address including PSC and box no.)* .....

.....

If previous candidate: *(list year and candidate number)* .....

Information on Parent

Name, rank, social security number, component and branch of service: .....

.....

Organizational address: .....

Retired or deceased: *(give date and attach copy of retirement orders or casualty report)* .....

.....

Officer personnel: *(attach certified statement of service prepared by personnel officer specifying all periods of active duty)*.....

Enlisted personnel: *(attach statement prepared by personnel officer specifying all periods of active duty, listing date of enlistment and date of enlistment expiration)* .....

.....

Sincerely,

Signature .....

FORMAT

Request for Children of Deceased or Disabled Veterans Nomination

Date.....

Director of Cadet Admissions
USAF Academy, Colorado 80840

Dear Sir:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I request a nomination under the Children of Deceased or Disabled Veterans category for the class that enters the Air Force Academy in June 1977 and submit the following data:

Name: *(print as shown on birth certificate; if different from the name you use, attach a copy of court order, if applicable)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

Permanent phone number and area code: .....

Current phone number and area code: .....

Date and place of birth: *(spell out month)* .....

.....

Date of high school graduation: .....

If member of military *(list your rank, social security number, regular or reserve component, branch of service, and organizational address including PSC and box no.)* .....

.....

If previous candidate: *(list year and candidate number)* .....

Information on Parent

Name, rank, social security number, component and branch of service: .....

.....

Date and place of death or date and place disability occurred: .....

.....

Cause of death or disability: *(forwarding a copy of casualty report or copy of disability retirement order may expedite processing of your application)* .....

.....

Veterans Administration XC claim number: .....

Address of VA office where case is filed: .....

Sincerely,

Signature.....

FORMAT

Request for Children of Persons in a Missing Status Nomination

Date.....

Director of Cadet Admissions
USAF Academy, Colorado 80840

Dear Sir:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I request a nomination under the Children of Persons in a Missing Status category for the class that enters the Air Force Academy in June 1977 and submit the following data:

Name: *(print as shown on birth certificate; if different from the name you use, attach a copy of court order, if applicable)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

Permanent phone number and area code: .....

Current phone number and area code: .....

Date and place of birth: *(spell out month)* .....

.....

Date of high school graduation: .....

If member of military *(list your rank, social security number, regular or reserve component, branch of service, and organizational address including PSC and box no.)* .....

.....

If previous candidate: *(list year and candidate number)* .....

Information on Parent

Name, rank, social security number, component and branch of service: .....

.....

(Attach copy of DD Form 1300, Report of Casualty)

Sincerely,

Signature.....

FORMAT

Request for Children of Medal of Honor Recipients Nomination

Date.....

Director of Cadet Admissions
USAF Academy, Colorado 80840

Dear Sir:

It is my desire to attend the Air Force Academy and to serve in the United States Air Force. I request a nomination under the Children of Medal of Honor Recipients category for the class that enters the Air Force Academy in June 1977 and submit the following data:

Name: *(print as shown on birth certificate; if different from the name you use, attach a copy of court order, if applicable)* .....

Social Security number: .....

Permanent address: *(street, city, county, state, zip code)* .....

.....

Temporary address: .....

Permanent phone number and area code: .....

Current phone number and area code: .....

Date and place of birth: *(spell out month)* .....

.....

Date of high school graduation: .....

If member of military *(list your rank, social security number, regular or reserve component, branch of service, and organizational address including PSC and box no.)* .....

.....

If previous candidate: *(list year and candidate number)* .....

Information on Parent

Name, rank, social security number, component and branch of service of parent to whom the Medal of Honor was awarded: .....

.....

Sincerely,

Signature.....

SUMMARY OF COURSE OFFERINGS

Courses offered in the curriculum including core and majors courses.

Aeronautics
Airmanship
Area Studies
Astronautics
Atmospheric Science
Aviation
Behavioral Sciences
Biological Sciences
Chemistry
Civil Engineering
Computer Science
Economics
Electrical Engineering
Engineering
English
Fine Arts
Foreign Languages
  Arabic
  Chinese
  French
  German
  Japanese
  Russian
  Spanish
  Special Topics
  Independent Study
Geography
History
Humanities
Instructional Technology
Law
Management
Mathematics
Mechanics
Military Studies
Military Training
Navigation
Philosophy
Physical Education
Physics
Political Science
Science

Descriptions of the courses to be offered during the academic year 1976-1977 are listed by subject in alphabetical order. Course numbers have a general meaning. The first digit of a course number usually indicates the class year for which the course is designed: 100 series for the Fourth Class year; 200 series the Third Class year; 300 series the Second Class year; and 400 series the First Class year.

Following the description of each course is a code such as 0, 1 or 2. This number is the course unit value which is used to determine a cadet's course load for a semester. After this number there may be an additional number in parentheses which is used for scheduling purposes and identifying the number of class hours the course meets per academic lesson.

Final examination or final report requirements, course prerequisites and semester hours are shown at the end of each course description. A designation of Pass/Fail at the end of a course description means that no letter grade is given and the student receives a Pass or Fail mark for the entire course. Courses without this designation are graded.

Aeronautics *(Aero)*

Offered by the Department of Aeronautics

Aero 311. Fundamentals of Aeronautics 1(1)

Airfoil subsonic flow pattern and pressure distribution. Typical supersonic flow effects. Wing lift, drag and pitching moment. High lift devices. Wing planform effects and airplane drag. Thrust and drag variations with Mach number. Airplane performance, energy height and specific excess power. Minimum-time climb trajectories. Airplane stability and control contributions of the wing-aileron, vertical tail-rudder and horizontal stabilizer-elevator (elevon). Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall or spring.

Aero 312. Introductory Engineering Thermodynamics 1(1)

Fundamental aspects, concepts, and laws of thermodynamics. Energy and the first law. Study of fluid properties and thermodynamic state. States of simple substances. Energy analysis of thermodynamic systems. Entropy and the second law. Reversible and irreversible processes. Applications of the second law. Thermodynamics of propulsion. Final exam. Prereq: Math 132 (122). Sem hrs: 3 fall or spring. First offering: Spring 1977.

Aero 332. Introduction to Aeronautics and Thermodynamics II 1(2)

Continuation of Aero 331, an introduction to the aeronautical disciplines of aerodynamics, thermodynamics, and flight mechanics. Lab. Final exam. Prereq: Aero 331 in the preceding semester. Sem hrs: 3 fall. Last offering: Fall 1976.

Aero 350. Aeronautical Laboratory 1(2)

Selected experiments in the fields of aerodynamics, gas dynamics, propulsion, and flight dynamics. Final report. Prereq: Aero 361. Sem hrs: 3 fall or spring. Last offering: Spring 1978.

Aero 356. Flight Mechanics I 1(1)

Airplane equations of motion. Takeoff and landing, steady climbs and descents, cruise flight (range and endurance). Accelerated performance, turns. Static and dynamic stability. Control and handling qualities. Lab. Final exam. Prereq: Aero 311 (331). Sem hrs: 3 fall or spring. First offering: Spring 1977.

Aero 361. Thermofluid Dynamics 1(1)

The second law of thermodynamics, power cycles, dimensional analysis, control volume analysis of fluid flow, one dimensional compressible flow, normal and oblique shocks, lift and drag calculations. Lab. Final exam. Prereq: Aero 331 in preceding semester; Math 124. Sem hrs: 3 fall. Last offering: Fall 1976.

Aero 362. Aerodynamics 1(2)

Determination of aerodynamic forces on thin wings and slender bodies in subsonic, supersonic and hypersonic flows and on blunt bodies in hypersonic flow. Newtonian flow, method of characteristics and similarity rules. Lab. Final exam. Prereq: Aero 361; Math 221. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Aero 363. Heat Transfer 1(1)

Energy transport by conduction, convection, and radiation. General heat conduction differential equation and its application to simple conduction problems with and without heat generation, heat flow in fins, and unsteady heat flows. Treatment of fluid dynamics and thermal boundary layers as applied to flat plates in forced convection. Reynold's analogy. Black and gray body radiation, and radiation inside enclosures. Lab. Final exam. Prereq: Aero 312 (331). Sem hrs: 3 fall or spring.

Aero 371. Aerodynamics I 1(1)

The fluid medium, kinematics and dynamics of a fluid field, flow about a body, thin airfoil theory and the finite wing, compressible flow and energy relations, applications of one-dimensional compressible flow including shocks and Prandtl-Meyer flow. Lab. Final exam. Prereq: Completed or enrolled in Aero 312; Math 134. Sem hrs: 3 fall or spring. First offering: Spring 1977.

Aero 372. Aerodynamics and Design 1(2)

Application of lifting line theory to the determination of span and chordwise load distributions on lifting surfaces. Effect of shape and planform on external aerodynamic load distributions. Determination of aerodynamic loads as a function of flight conditions. External and internal design of major aircraft components (wings, fuselages, tail sections). Lab. Final report. Prereq: completed or enrolled in Aero 371. Sem hrs: 3 fall or spring. First offering: Fall 1978.

Aero 434. Aircraft and Engine Performance Laboratory 1(2)

Selected experiments in the fields of flight mechanics and aerospace propulsion. A laboratory course designed for students not pursuing an aeronautical engineering major. Final report. Prereq: Aero 312 (332) or Aero 361. Sem hrs: 3 fall or spring.

Aero 450. Aeronautical Laboratory 1(2)

Selected experiments in the fields of aerodynamics, gas dynamics, propulsion, and flight mechanics. Utilization of wind tunnel in design project. Lab. Final report. Prereq: Aero 371; Aero 356. Sem hrs: 3 fall or spring. First offering: Fall 1978.

Aero 456. Flight Mechanics I 1(1)

Take-off and landing, level flight, steady climb and accelerated climb, maximum range and endurance. Longitudinal and lateral static stability and control, maneuvering flight, and dynamic stability. Lab. Final exam. Prereq: Aero 331; Math 221. Sem hrs: 3 fall or spring. Last offering: Fall 1976.

Aero 457. Flight Mechanics II *1(1)*
Continuation of Aero 356. General equations of aircraft motion. Topics in accelerated performance. Extension of aircraft stability, control and handling qualities analyses. Lab. Final exam. Prereq: Aero 356 (456); Math 351. Sem hrs: 3 fall or spring.

Aero 461. Propulsion I *1(1)*
Chemical rockets and airbreathing engines. Fluid mechanics, thermodynamics and chemistry of propulsion. Rocket nozzle performance. Cycle analysis and preliminary design of ramjets, turbojets and turbofans. Lab. Final exam. Prereq: Aero 371 (361). Sem hrs: 3 fall or spring.

Aero 462. Propulsion II *1(1)*
Advanced studies of airbreathing and rocket propulsion systems and other energy conversion techniques. Final exam. Prereq: Aero 461. Sem hrs: 3 fall.

Aero 463. Advauced Topics in Aeronautics *1(1)*
Topics of current interest in aerodynamics, propulsion, performance, stability and control. Final exam. Prereq: Aero 471 (362) or department permission. Sem hrs: 3 spring.

Aero 464. Aircraft Design *2(2)*
Fundamentals of design presented by preliminary design of an advanced airlift vehicle. Determination of vehicle configuration to meet given specifications, weight estimation, selection of propulsive system, performance calculations, longitudinal and lateral static stability analysis. Field trip. Lab. Final report. Prereq: Aero 471 (362); completed or enrolled in Aero 356 (456). Sem hrs: 6 spring.

Aero 466. Propulsion Design *2(2)*
Individual problems in propulsion systems design. Field trip. Lab. Final report. Prereq: Aero 461. Sem hrs: 6 spring.

Aero 471. Aerodyuamics II *1(2)*
One-dimensional gas dynamics and wave motion, waves in supersonic flow, flow in ducts and wind tunnels, equations of frictionless flow, small perturbation theory, slender body theory, similarity rules, introduction to viscous flows. Lab. Final exam. Prereq: Aero 371. Sem hrs: 3 fall or spring. First offering: Fall 1977.

Aero 472. Thermodynamics of Energy Conversiou *1(1)*
Study of the laws and concepts of thermodynamics with applications to power generation. Principles of energy release and conversion into useful work. Thermodynamic availability. Applications to vapor power cycles, internal combustion engines, and direct energy conversion. Final exam. Prereq: Aero 312 (332) or Aero 361. Sem hrs: 3 fall or spring.

Aero 473. Aerodynamics of Real Fluids *1(1)*
Analysis of laminar and turbulent boundary layers. Solutions by analytical and numerical means. Introduction to kinetic theory of gases including flow with translational non-equilibrium. Final exam. Prereq: Aero 362. Sem hrs: 3 fall. Last offering: Fall 1977.

Aero 495. Special Topics *1(1-2)*
Selected topics in aeronautics. Final exam or final report. Prereq: department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Aero 499. Independent Study *0-2(0)*
Individual study and research supervised by a faculty member. Topic established with the department head. Final report. Sem hrs: 1 to 6 fall or spring.

Airmanship *(Armnshp)*

Offered by the Deputy Commandant for Military Instruction

Armnshp 101. Sailplane Introduction *0(0)*
Required course for the Fourth Class to provide an introduction to the basic principles of flying, motivation for further development of aviation skills, and an appreciation for related responsibilities. Consists of 1-3 sailplane sorties utilizing both winch and aerial tow launches. Pass/Fail. Sem hrs: 0 fall or spring.

Armnshp 470. Airplane Rating, Instrument *0(0)*
Dual instruction, ground school, and instrument trainer instruction to complete the requirements for an FAA Pilot Certificate, Instrument Rating. Pass/Fail. Prereq: Armnshp 450 or FAA Private Pilot Certificate. Any cadet who possesses an FAA Instrument-Airplane Rating may validate this course. Sem hrs: 1½ summer, fall or spring.

Armnshp 471. Glider Rating, Flight Instructor *0(0)*
Dual instruction, ground school, and solo flight requirements for an FAA Flight Instructor Certificate-Glider Rating. (Completion during summer offering fulfills requirement for Mil Tng 200 or ½ requirement for Mil Tng 300 or Mil Tng 400.) Pass/Fail. Prereq: Armnshp 461 or FAA Pilot Certificate-Glider Rating, Commercial. Sem hrs: 2 summer, fall or spring.

Armnshp 370. Jet Flight Indoctrination *0(0)*
Provides the cadet with an appreciation of aviation skills, aircrew responsibilities and jet aircraft capabilities. Four local flights in the T-37 jet aircraft. Fourth Classmen will be scheduled for the first flight. Includes aircraft familiarization, navigation, instruments, and aerobatics. Pass/Fail. Sem hrs: ½ fall or spring.

Armnshp 410. T-41 Flying Training 1(3)

Required course for all physically qualified First Classmen who volunteer to attend USAF Undergraduate Pilot Training following graduation. Includes dual flight instruction, solo flight training, flying safety and squadron operations. Pass/Fail. (Credit awarded only when course is completed in addition to normal summer training.) Prereq: 1/C standing. Must be taken concurrently with Armnshp 411. Sem hrs: 3 summer, fall or spring. Last offering: Spring 1977.

Armnshp 411. T-41 Ground School Instruction 1(1)

Required course for all physically qualified First Classmen who volunteer to attend USAF Undergraduate Pilot Training following graduation. Includes classroom instruction in T-41 Systems, Local Area Procedures, Emergency Procedures, Radio Navigation and Basic VFR Navigation. Final exam. (Credit awarded only when course is completed in addition to normal summer training.) Prereq: 1/C standing; must be taken concurrently with Armnshp 410. Sem hrs: 2 summer, fall or spring. Last offering: Spring 1977.

Armnshp 432. Cadet Parasail Instructor Training 0(0)

Trains selected cadets as instructors for parasail operations during BCT and the academic year. Consists primarily of instruction techniques, parasail procedures, equipment operation, and proficiency tows. Pass/Fail. Prereq: Mil Tng 452 or Armnshp 490. Sem hrs: 1 fall or spring.

Armnshp 433. Cadet Parasail Instructor Duty 0(0)

Open to selected cadets who wish to serve as instructors in Armnshp 432 and BCT parasail orientation. (Completion during summer offering fulfills requirement for Mil Tng 200 or ½ requirement for Mil Tng 300 or Mil Tng 400.) Pass/Fail. Prereq: Armnshp 432. Sem hrs: 2 summer, 1 fall or spring.

Armnshp 440. Pilot Indoctrination Program 1(3)

Armnshp 441. Pilot Indoctrination Program 0(0)

Required course for all physically qualified First Classmen who volunteer to attend USAF Undergraduate Pilot Training following graduation. Includes ground training for T-41 aircraft and FAA Private Pilot exam, dual flight instruction and solo flight training.

Armnshp 440. (Summer credit awarded only when course is completed in addition to normal summer training) Final exam. Prereq: 1/C standing. Sem hrs: 3 summer, fall or spring.

Armnshp 441. (Fulfills one-half of the requirement for Mil Tng 400, First Class summer training.) Final exam. Prereq: 1/C standing. Sem hrs: 3 summer. First offering: Summer 1977.

Armnshp 450. Airplane Rating, Private 0(0)

Dual instruction, ground school, and solo flight training to complete the requirements for an FAA pilot Certificate. This training is conducted with the USAFA Aero Club through the Cadet Aviation Club (a cadet extracurricular activity) and is available to a limited number of cadet volunteers. Any cadet who possesses an FAA private pilot airplane rating may validate this course. Pass/Fail. Sem hrs: 2 summer, fall or spring.

Armnshp 451. Glider Rating, Private 0(0)

Dual instruction, ground school and solo flight training to complete the requirements for an FAA Pilot Certificate-Glider Rating, Private. (Completion during summer offering fulfills requirements for Mil Tng 200.) Pass/Fail. Sem hrs: 2 summer.

Armnshp 460. Airplane Rating, Commercial 0(0)

Dual instruction, ground school, and solo flight training to complete the requirements for an FAA Pilot Certificate-Airplane Rating, Commercial. Pass/Fail. Prereq: Armnshp 450 or FAA Private Certificate. Any cadet who possesses an FAA Commercial Pilot-Airplane Rating may validate this course. Sem hrs: 2 summer, fall or spring.

Armnshp 461. Glider Rating, Commercial 0(0)

Dual instruction, ground school, and solo flight requirements for a Pilot Certificate-Glider Rating, Commercial. (Completion during summer offering fulfills requirement for Mil Tng 200 or ½ requirement for Mil Tng 300 or Mil Tng 400.) Pass/Fail. Prereq: Armnshp 451 or FAA Pilot Certificate-Glider Rating. Private. Sem hrs: 2 summer, fall or spring.

Armnshp 480. Airplane Rating, Flight Instructor 0(0)

Meeting the requirements for an FAA Flight Instructor Certificate-Airplane Rating. Pass/Fail. Prereq: Armnshp 460. Any cadet who possesses an FAA Flight Instructor Certificate-Airplane Rating may validate this course. Sem hrs: 1½ summer, fall or spring.

Armnshp 481. Cadet Soaring Instructor Duty 0(0)

Open to selected cadets who wish to serve as flight and ground instructors in Armnshp 101, 451, 461 and 471. (Completion during summer offering fulfills requirement for Mil Tng 200 or ½ requirement for Mil Tng 300 or Mil Tng 400.) Pass/Fail. Prereq: Armnshp 471. Sem hrs: 2 summer, fall or spring.

Armnshp 490. Basic Free Fall Parachuting 0(0)

Instruction in emergency use of the parachute. Familiarizes cadet with emergency and free fall parachuting as it pertains to his future Air Force career. Jump requirements for completion are determined by the

USAFA Airmanship Division consistent with Air Force directives. (Completion during summer offering fulfills requirement for Mil Tng 200, Mil Tng 300 or Mil Tng 400.) Pass/Fail. Sem hrs: 2 summer, fall or spring.

Armnshp 491. Advanced Parachute Training 0(0)

Ground and aerial training which allows cadets to progress from initial free fall training to the basics of delayed free falls, controlled body maneuvers, precision landing and competitive parachuting. Requirements are fulfilled toward Class B, U.S. Parachute Association License. Pass/Fail. Prereq: 3/C standing; Armnshp 490. Sem hrs: 1½ fall or spring.

Armnshp 492. Cadet Parachute Instructor Training 0(0)

Trains selected cadets as instructors for Armnshp 490. Consists primarily of instruction techniques, jumpmaster procedures, and proficiency jumps. Requirements are fulfilled toward an FAA Senior Rigger Certificate and a Class C, U.S. Parachute Association License with jumpmaster rating. Pass/Fail. Prereq: Armnshp 491. Sem hrs: 2 spring.

Armnshp 493. Cadet Parachute Instructor Duty 0(0)

Open to selected cadets who wish to serve as instructors in Armnshp 490. Cadets compete in collegiate meets or participate in parachute demonstrations. Requirements are fulfilled toward a Class D, U.S. Parachute Association License. (Completion during summer offering fulfills ½ requirement for Mil Tng 300 or Mil Tng 400.) Pass/Fail. Prereq: Armnshp 492. Sem hrs: 2 summer, fall or spring.

See Mil Tng 100 for additional cadet flying administered by the Airmanship Division.

Area Studies *(Area Stu)*

Offered by the Department of English and Fine Arts

Area Stu 351. The American Identity 1(1)

Interdisciplinary course. Considers the origins, development, and nature of the American character. Readings, reports, and projects incorporate the views and methodology of Literature, Law, Philosophy, and the Social Sciences. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall.

Astronautics *(Astro)*

Offered by the Department of Astronautics and Computer Science

Astro 332. Introduction to Astronautics 1(1)

Fundamental survey of the problems and principles of astronautics: Includes problem modeling, elementary error analysis, flat earth trajectories, ballistic missile trajectories, a survey of rocket propulsion, inertial navigation and guidance, physiological problems of space travel, re-entry, the space environment and present Air Force space operations. The application of the restricted two-body model to satellites and interplanetary trajectories includes integrals of the equations of motion, methods of orbit description and determination, Hohmann and general transfer orbits, plane changes, satellite rendezvous, and ground traces. Final exam. Prereq: Mech 110 (120); Math 134 (124); completed or enrolled in Physics 211. Sem hrs: 3 fall or spring.

Astro 395. Aerospace Flight Simulation 1(2)

An introductory and interdisciplinary course integrating pilot response to the dynamics of an aerospace flight simulator. Small teams analyze in depth one of the following areas: human response, pilot-vehicle interaction, vehicle and trajectory math models, vehicle control laws, or computer interface and software. Total system design is accomplished by management of group interaction. Flight tests are performed on the T-38 combat simulator and/or the moveable space docking simulator. Lab. Final project report. Prereq: 1/C or 2/C standing with department permission. Sem hrs: 3 spring.

Astro 450. Principles of Airborne Fire Control 1(1)

Current Air Force fire control systems are analyzed to explain the engineering application of vector kinetics, kinematics, linearization theory, introduction to inertial sensors and rigid body motion. The AC-130 gunship, F-4, F-15, F-106 gun fire control systems are used to explain air-to-ground and air-to-air weapons delivery. Air-to-air missile guidance. Field trip to understand implementation of an operational system. Final exam. Prereq: Mech 320 (361); Engr 350 (Science 350) or El Engr 340 (332). Sem hrs: 3 fall.

Astro 451. Astrodynamics 1(1)

A basic course in astrodynamics based on two-body orbit mechanics. Topics include an introduction to orbit determination, time and position in the orbit, orbit maneuvers, rendezvous and docking and lunar trajectories. Emphasis is on problem solving with specific applications toward astrodynamics. Final exam. Prereq: Completion of any core math sequence; Comp Sci 100 (200); Astro 332; completed or enrolled in Mech 320 (361). Sem hrs: 3 fall or spring.

Astro 452. Linear Control System Analysis 1(2)

Formulation and analysis of the linear control problem by both state variable and transform methods. Synthesis of linear control systems emphasizing the root locus method. Includes laboratory analysis and synthesis with real hardware and/or analog simulation. Final report. Prereq: Engr 350 (Science 350) or El Engr 340 (345). Sem hrs: 3 fall or spring.

Astro 453. Advanced Astrodynamics 1(1)
A continuation of Astro 451. Topics include orbit determination, data smoothing, differential correction, general and special perturbations and interplanetary trajectories. Course is directed toward the development of tools and skills necessary to solve realistic problems in astrodynamics. Final exam. Prereq: Astro 451. Sem hrs: 3 spring.

Astro 454. Inertial Navigation and Automatic Guidance 1(1)
Inertial navigation including studies of the gyroscope, accelerometer, gyrostabilized platform, gyrocompass, system mechanization, navigation equation development and solution. Automatic guidance including methods of developing guidance equation for steering booster rockets to accomplish missions such as orbital injection, orbital intercept, ballistic bombing, and soft landing. Final exam. Prereq: Astro 332; Astro 452. Sem hrs: 3 spring.

Astro 465. Modern Control Theory and Design 1(2)
Linear system analysis using state variable approach, phase plane analysis of linear and non-linear systems, estimation of variables, optimization theory. Design of controls for typical Air Force systems such as attitude control, IR seeker missiles, ICBM gimballed thrusters. Final project report. Prereq: Completed or enrolled in Astro 452 or department permission. Sem hrs: 3 fall.

Astro 466. Digital Control Theory and Design 1(2)
Recent theory and developments in digital control systems related to Air Force systems. Sampled data systems, z-transform theory, digital estimation, optimal digital systems. Man-in-the-loop systems and system identification techniques. Design of typical digital control systems using minicomputers. Final project report. Prereq: Astro 465 or department permission. Sem hrs: 4 spring.

Astro 467. Mission Analysis for Aerospace Vehicles 1(1)
Analysis of aerospace missions and interaction of mission objectives with vehicle design requirements and constraints. Includes systems analysis of propulsion, guidance, navigation, attitude control, thermal control, life support, power and communications requirements. Preliminary design of a launch vehicle or spacecraft to satisfy a specific mission. Digital computer used as a design tool. Field trip. Final report. Prereq: Completed or enrolled in Astro 451 or department permission. Sem hrs: 3 fall.

Astro 468. Aerospace Vehicle Systems Design 1(2)
Design of aerospace systems and subsystems. Description and applications of state-of-the-art subsystems and advanced designs. Application of tools and techniques from previous courses including digital and analog computers for analysis and synthesis. Completion or extension of design project begun in Astro 467. Field trip and lab. Final project report. Prereq: Astro 467 in previous semester. Sem hrs: 4 spring.

Astro 495. Special Topics 1(1)
Selected topics in astronautics. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Astro 499. Independent Study 1-2(0)
Individual study and research supervised by a faculty member. Topic established with the department head. Final report. Sem hrs: 2 to 6 fall or spring.

Atmospheric Science *(Atm Sci)*

Offered by Department of Physics

Atm Sci 250. Introduction to Atmospheric Sciences 1(1)
Composition, structure, behavior of the atmosphere. Emphasizes causes of observed phenomena in terms of fundamental physical concepts. Vertical structure, the nature of atmospheric variables and the interrelations of these variables, air masses and fronts, radiation processes, clouds and precipitation, horizontal motions, general circulation, vertical and horizontal analysis of a specific weather situation, discussions of current weather. Field trip. Final exam. Prereq: Physics 211. Sem hrs: 3 fall or spring.

Atm Sci 351. Physical Processes in the Atmosphere 1(1)
Physical concepts of cloud and precipitation formation including weather modification, atmospheric optics and acoustics, radar meteorology, aeronomy, radiation laws, atmospheric energy balance, and introduction to air pollution. Final exam. Prereq: Completed or enrolled in Atm Sci 250. Sem hrs: 3 fall.

Atm Sci 380. Weather Forecasting Techniques 1(1)
Analysis of a classical weather situation leading to an evaluation and interpretation of centrally prepared weather charts. Short range local forecasts that include: weather peculiarities, objective forecasting methods, role of convergence and divergence, temperature advection, thickness patterns, and vorticity. Flight forecasting for aircraft operations. Daily discussion of current weather over continental U.S., local area forecasts and debriefs. Term project. Prereq: Atm Sci 250. Sem hrs: 3 fall or spring.

Atm Sci 445. Atmospheric Dynamics 1(1)
Thermodynamics and fluid motion dynamics to include: variables of state, equation of state, thermodynamics of dry, moist and saturated air; changes

of phase; thermodynamic diagrams; hydrostatic equilibrium and altimetry; stability; fundamental and apparent forces; vector equation of motion, geostrophic and ageostrophic motion, vorticity, circulation, cyclone and frontal development. Final exam. Prereq: Atm Sci 250. Sem hrs: 3 fall.

Atm Sci 495. Special Topics *1(1)*

Selected topics in atmospheric science. Final exam or final report. Prereq: Department permission. Sem hrs: 3 spring.

Aviation *(Av)*

Offered by the Deputy Commandant for Military Instruction

Av 101. Aviation Physiology Passenger Qualification *0(1)*

Classroom studies in the responses of the human organism as it reacts to stresses of various environments including space, pollution, nutrition, fatigue, subsonic or supersonic flight and certain other aerodynamic stresses that alter normal physiology. Physiology training is provided to prepare cadets for hypobaric chamber flights and subsequent aircraft flight exposure. One field trip to hypobaric chamber. Final exam. Sem hrs: ½ fall or spring.

Av 460. Studies in Aviation Fundamentals *0(0)*

Required course for all cadets not volunteering for pilot training. Course will be taken during the 1st or 2nd summer period of the 2nd class or 1st class summer. Aviation instruction in the Air Force flying mission including classroom, trainer/simulator, and T-43 flight avionics. Experience is gained in the Science of Navigation to demonstrate professional Air Force flight duties/responsibilities. Fulfills ½ requirement of Mil Tng 300 or Mil Tng 400. No final exam. Prereq: 1/C or 2/C standing or CWIN approval. Sem hrs: 3 summer. Av 470 taken during the fall or spring semester is an authorized substitute.

Av 470. Applied Aviation and Navigation Theory *1(2)*

Practical application of air navigation and aviation procedures/equipment. Includes classroom and simulator instruction in preparation for flight missions in the T-43 aircraft. Encompasses air navigation from basic dead reckoning through radio, radar, and celestial positioning techniques. Develops an insight into the requirements and responsibilities of a rated Air Force crew member through actual experience in a flying environment, on both local and cross-country flights. Final exam. Prereq: 1/C, 2/C or 3/C standing. Sem hrs: 3 fall or spring. Av 470 is an authorized aviation core substitute for Av 460. (Not open to cadets with credit for Av 460.)

Av 490. Avionics Concepts and Systems Development *1(1)*

Discussion of avionics and systems including inertial, Doppler, astro trackers and radar. In depth study of the underlying theory for these systems using the T-43 as an example of a modern, integrated navigation system. Inflight application of academics in conjunction with a visit to a facility involved in the development or operation of advanced navigation systems. Final report. Sem hrs: 3 fall or spring.

Av 493. Cadet Aviation Instructor Training *0(0)*

Trains selected cadets as instructors for aviation flying programs. Provides additional training in navigation techniques, and provides field training in astronomy and planetarium operation. To retain rating, qualified cadet instructors must maintain required instructor proficiency in subsequent semesters. (Fulfills ½ requirement for Mill Tng 300 or Mil Tng 400.) Final exam. Prereq: Av 470 or Av 460. Sem hrs: 3 summer.

Av 494. Cadet Aviation Instructor Duty *0(0)*

Cadets maintain proficiency acquired in Av 493. Instructs in Av 470 and Av 460 classroom, trainers and flying programs. To retain rating cadet must provide 100 hours of contact time with Navigation Division programs each semester. No final. Prereq: Av 460 or Av 470 and Av 493. Sem hrs: 3 summer, fall or spring.

See Navigation and Science listings for other Aviation Science Division courses

See Mil Tng 100 for additional cadet flying administered by the Aviation Science Division.

Behavioral Sciences *(Beh Sci)*

Offered by the Department of Behavioral Sciences and Leadership

Beh Sci 110. General Psychology *1(1)*

Presents those determinants of behavior which contribute to physical, psychological, and social maturity. Applies psychological principles from the areas of learning, perception, motivation, personality, mental health, and group processes to understanding human behavior, achieving personal adjustment and developing Air Force leadership. Final exam. Sem hrs: 3 fall or spring.

Beh Sci 211. General Psychology *1(1)*

Presents those determinants of behavior which contribute to physical, psychological, and social maturity. Applies psychological principles from the areas of learning, perception, motivation, personality, mental health, and group processes to understanding human

behavior, achieving personal adjustment and developing Air Force leadership. Final exam. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Beh Sci 220. Behavioral Science Applications to Leadership — Phase I ½(1)

Phase I of the interdisciplinary study of behavioral science applications to leadership roles. Both organizational and small group dynamics are examined as sources of influence on the leader and the led. This includes an in-depth analysis of both the leader's role in managing human resources and as a decision maker. Topical military problems are considered in the light of contemporary leadership principles and behavioral theory. Final exam. Prereq: Beh Sci 110 (211); 3/C standing. Sem hrs: 1½ fall or spring. First offering: Fall 1977.

Beh Sci 302. Applied Behavorial Science in the Military Environment 1(1)

An interdisciplinary study of behavioral science applications related to the leadership role and the military environment. Individual behavior, group processes, and the larger environment are studied as sources of influence on the leader and the led. Topical problems are considered in light of contemporary behavioral theory. Final exam. Prereq: Beh Sci 110 (211); 3/C or higher standing. Sem hrs: 3 fall or spring. Last offering: Spring 1978.

Beh Sci 330. Behavioral Science Applications to Leadership — Phase II ½(1)

Phase II of the interdisciplinary study of behavioral science applications to leadership roles. Primary emphasis is placed on identifying and developing leadership behaviors involved in personal interactions between the leader and subordinates. Counseling techniques are studied to include: skill acquisition in the major approaches to counseling, the leader's role as a motivator of individual behavior, and professional military concerns in the interaction process. Topical military problems are considered in the light of current behavioral science knowledge. Final exam. Prereq: Beh Sci 220; 2/C standing. Sem hrs: 1½ fall or spring. First offering: Fall 1978.

Beh Sci 331. Statistical Tests and Measurements 1(2)

An introduction to the general area of measurement in the behavioral sciences and training with emphasis on the theory and techniques for assessing human performance, achievement, aptitudes, attitudes, abilities and values. Specific emphasis is placed on the concepts of validity, reliability and appropriate hypothesis testing schemes for human behavioral data. Final exam. Prereq: Beh Sci 110 (211). Sem hrs: 3 fall or spring.

Beh Sci 350. Psychobiology 1(1)

Examines the neurophysiological bases of human and animal behavior. Emphasis is given to central nervous system mechanisms which mediate processes such as learning, intelligence, perception and emotional behavior. Correlates the experimental evidence of physiology and psychology in explaining behavior. Final exam. Prereq: Bio Sci 110 (Life Sci 210); Beh Sci 110 (211). Sem hrs: 3 spring.

Beh Sci 351. Cultural Anthropology 1(1)

The study of man as culture determines his behavior. Using theories of the nature of culture and cultural processes, contemporary cultures are analyzed focusing on problems inherent in their interrelations. Final exam. Sem hrs: 3 fall or spring.

Beh Sci 352. Social Psychology 1(1)

Investigates interactional forces between groups and the individual in society. Examines effects of diverse social and psychological pressures such as public opinion and propaganda on the individual and groups. Emphasis is placed on attitude formation, selective perception, and attitude change. Final exam. Prereq: Beh Sci 110 (211). Sem hrs: 3 fall.

Beh Sci 360. Sociology 1(1)

Scientific study of the influence of group life on human behavior. Major emphasis is on such contemporary social problems as race relations, drugs, the environment, and cultural change as well as military and civilian attitudes and values. Final exam. Sem hrs: 3 fall or spring.

Beh Sci 370. Tests and Measurements 1(1)

Introduction to the general area of educational and psychological measurement. Theory, content, and uses of measuring devices in the determination and analysis of individual differences. Emphasis on performance, ability, and achievement tests and interpretation of test results. Final exam. Prereq: Beh Sci 110 (211); completed or enrolled in Beh Sci 331. Sem hrs: 3 fall. Last offering: Fall 1976.

Beh Sci 372. Experimental Psychology 1(2)

Experimental design and psychological research methods with special application to Air Force problems of human behavior. Considers major experimental methods and principles used in solution and analysis of problems related to psychological research. Lab. Individual research project. Prereq: Beh Sci 110 (211); department permission. Sem hrs: 3 spring.

Beh Sci 380. Personality Theory 1(1)

Analysis of principal aspects of personality, its determinants, and major theoretical problems. Emphasis is placed on study of major personality theories and contribution of each to understanding personality from clinical and experimental viewpoints. Related research and assessment techniques are reviewed. Final exam. Prereq: Beh Sci 110 (211). Sem hrs: 3 fall.

Beh Sci 390. The Military in Evolving Society 1(1)

Examines the problems the military officer faces in successfully fulfilling dual roles as an officer and as

a member of American society. Problems resulting from the changing role of the military in American society, areas of difference and similarity in military and civilian life, and conditions unique to the military situation are seen through a sociological perspective. Problem oriented research paper and briefing. Sem hrs: 3 spring.

Beh Sci 435. Learning *1(2)*

Investigation of the learning process to include basic principles of learning and critical examination of learning theories. Emphasis on learning research methodology and evaluation of research on learning principles. Current applications of research and theories are reviewed. Lab. Final exam. Prereq: Beh Sci 110 (211); department permission. Sem hrs: 3 fall or spring.

Beh Sci 464. Organizational Behavior Practicum *1(2)*

Organizational behavior studies with practical applications of theory to exercise situations. Cadets required to develop managerial skills and techniques. Cadet teams are jointly responsible for resolution of internal and external managerial challenges. Exercises are conducted at the individual, team and section participation levels. Techniques include team-task training, group dynamics, exercises, critical incidents, role playing and a data-bank exercise. Final exam. Sem hrs: 3 fall or spring.

Beh Sci 470. Human Factors and Perceptual Processes *1(2)*

Survey of human factors in engineering with particular reference to man-machine systems. Consideration of human abilities and limitations in relation to design and development of work environments in aerospace systems. Examines the role of perceptual processes in determining orientation of the individual to the world. Emphasis on an understanding of sensory mechanisms, perceptual organization and influence of personal factors on perception. Lab. Individual research project. Prereq: Beh Sci 110 (211); department permission. Sem hrs: 3 spring.

Beh Sci 477. Organizational and Industrial Psychology *1(1)*

Investigation of variables affecting job performance in military and industrial environments. Emphasizes organizational psychology, personnel measurement, selection and appraisal, social considerations in a working environment, systems development, and research methodology in analysis of organizational and industrial behavior. A review of the literature or completion of an individual research project on a selected topic is required. Final exam. Prereq: Beh Sci 330 (302). Sem hrs: 3 fall or spring.

Beh Sci 490. Counseling *1(1)*

Introduces student to the nature and goals of counseling. Examines the counseling relationship and the counseling process in the military environment; develops the main approaches to counseling and the theories and strategies of differing counselors. Seminar on selected issues such as professionalism, ethics and the military officer as a counselor. Practicum and mini-labs will be used to demonstrate and develop personal interactive skills as a counselor and officer. Field trip. Final exam. Prereq: Beh Sci 110 (211). Sem hrs: 3 fall or spring.

Beh Sci 495. Special Topics *1(1)*

Selected topics in psychology. Fall 1976 offering: Exceptional Behavior; Spring 1977 offering: To be announced. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Beh Sci 499. Independent Study *1(0)*

Independent research or practicum in a specific area of behavioral science. Conducted on a tutorial basis. Term paper. Prereq: 1/C standing; department permission. Sem hrs: 3 fall or spring.

Biological Sciences *(Bio Sci)*

Offered by the Department of Chemistry and Biological Sciences

Bio Sci 110. Aerospace Physiology *½(2)*

Classroom and laboratory studies in the basic physiological function of man's body systems. Emphasis is on responses of the human organism as it reacts to stresses of various environments including space, pollution, nutrition, fatigue, subsonic or supersonic flight, and certain other aerodynamic stresses that alter normal physiology. Final exam. Sem hrs: 1½ fall or spring.

Bio Sci 330. Introduction to Biological Sciences *1(2)*

An introduction to the basic concepts and vocabulary of modern biology. Special emphasis on fundamentals of cellular anatomy, bio-energetics, genetics, and reproduction. Demonstrations and student participation laboratories. Final exam. Sem hrs: 3 fall or spring.

Bio Sci 331. Plant and Animal Taxonomy *1(2)*

Continued introduction to fundamentals of biology with emphasis on plant and animal physiology and parasitic diseases pertaining to the global preparedness of an Air Force officer. Demonstration and student participation laboratories. Final report. Prereq: Completed or enrolled in Bio Sci 330. Sem hrs: 3 fall or spring.

Bio Sci 333. Environmental Physiology *1(1)*

The problems of physiological adaptation by man and other living organisms to natural environmental

stresses and artificial (space) environments. Final report. Sem hrs: 3 fall or spring. Last offering: Fall 1976.

Bio Sci 363. Genetics *1(1)*

Study of the laws of inheritance and their application to man. Interrelationships of hereditary and environmental effects on man's growth and development. Final exam. Sem hrs: 3 fall or spring.

Bio Sci 380. Bioenvironmental Science *1(1)*

Fundamental ecological interrelationships between organisms and their environments, including population interactions, energy and nutrient cycles, space and time utilization. Emphasis on how man's activities (agriculture, forestry, wildlife management, urban development, mineral and energy extraction, and air and water pollution) affect major biomes such as deserts, prairies, forests, lakes, and oceans. Discusses environmental threats due to man's impact on nature. Final exam. Sem hrs: 3 fall or spring.

Bio Sci 381. Advanced Bioenvironmental Science *1(1)*

Study of the anatomical and physiological mechanisms of homeostasis by which man and other animals are able to exist together under a wide range of natural and artificial environmental stresses. Discusses the effects of environmental stresses on man's ability to perform in a wide range of situations (office, manned flight, desert survival). Studies include why and how man maintains an artificial environment (clothing, cities, spacecraft), and the impact of the resulting man-made environmental stresses (air and water pollution, population crowding, etc.) on the basic physiological functions and thus health. Final report. Prereq: Bio Sci 380 or departmental permission. Sem hrs: 3 fall or spring. First offering: Spring 1977.

Bio Sci 383. Human Anatomy *1(2)*

Lecture and laboratory studies of detailed human anatomy with special emphasis on the following organ systems: skeletal, muscular, circulatory, digestive, respiratory, excretory, reproductive, endocrine, and nervous systems. Final exam. Prereq: Bio Sci 330 or departmental permission. Sem hrs: 3 fall or spring. First offering: Spring 1977.

Bio Sci 420. Biokinetics *1(1)*

In-depth lecture and seminar studies of the human organism in motion in terms of anatomical, physiological, and mechanical principles with special emphasis given to the effects of movement upon the structure and function of the human body. The biomechanical aspects of force, leverage, and impetus are explored in a variety of neuromuscular skills. Final exam. Prereq: Bio Sci 383. Sem hrs: 3 fall or spring. First offering: Fall 1977.

Bio Sci 431. Microbiology I *1(2)*

Lecture and laboratory studies of bacteria, viruses, and fungi common to our environment. Systematic identification and physiology of microbial species are emphasized. Final exam. Prereq: Bio Sci 330. Sem hrs: 3 fall or spring.

Bio Sci 432. Microbiology II *1(2)*

Lecture and practical laboratory studies of tissues with special emphasis on system and organ identification by staining techniques and microscopic identification. Final exam. Prereq: Bio Sci 431. Sem hrs: 3 spring. Last offering: Spring 1977.

Bio Sci 442. Medical Physiology *1(1)*

In-depth lecture and seminar studies of the physiology of human organ systems with special emphasis on the normal and pathological physiology of endocrinology, cardiology, circulation, respiration, and gastro-intestinal systems as they relate to aerospace medicine. Final exam. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Bio Sci 444. Radiation Biology and Biotechnology *1(1)*

Lecture and laboratory studies of the interactions of electromagnetic and particulate radiation with living systems. Special emphasis is placed on energy absorption, detection, and control. The application of electromagnetic radiation, lasers, the Doppler effect, ultrasound, and electron microscopy are presented with reference to problems of interest to the Air Force. Final report. Prereq: Bio Sci major or department permission. Sem hrs: 3 fall or spring.

Bio Sci 447. Physiology *1(2)*

Lecture and laboratory study of human physiology. Areas to be covered will include homeostasis, acclimatization to multiple stresses, nervous and endocrine control, special senses, and digestion. The system concept will be used. Final exam. Prereq: Bio Sci 383. Sem hrs: 3 fall. First offering: Fall 1977.

Bio Sci 448. Advanced Physiology *1(2)*

Lecture and laboratory study of human physiology, particularly in the Air Force environment. The systems approach will be used to cover cardiovascular, respiratory, water and electrolyte balance, musculoskeletal and reproductive systems. Emphasis will be on the whole individual. Final exam. Prereq: Bio Sci 447. Sem hrs: 3 spring. First offering: Spring 1978.

Bio Sci 460. Molecular Biology *1(1)*

A study of the macro and ultrastructure of the cell at it relates to function. Particular attention placed on control mechanisms, endocrinology, immunology, and homeostasis at the molecular level. Final exam. Prereq: Completed or enrolled in Chem 234. Sem hrs: 3 fall or spring.

Bio Sci 461. Developmental Anatomy I 2(3)
Classroom and laboratory study of embryonic development of various vertebrate animals. Detailed study of the fate and function of germ cell layers. Final exam. Prereq: 1/C standing; Life Sci 263. Sem hrs: 5 fall. Last offering: Fall 1976.

Bio Sci 462. Developmental Anatomy II 1(2)
Classroom and laboratory study of the comparative anatomy of vertebrate animals. Elements of classification and similarities of function. Final exam. Prereq: 1/C standing; Bio Sci 461. Sem hrs: 4 spring. Last offering: Spring 1977.

Bio Sci 465. Functional Anatomy I 1(2)
Lecture and laboratory studies of detailed human anatomy including basic histology of various tissues of the mammal, embryological origins of the tissue layers, and advanced physiology of selected topics. Final exam. Prereq: Life Sci 263. Sem hrs: 3 fall. Last offering: Fall 1976.

Bio Sci 466. Functional Anatomy II 1(2)
In-depth lecture and laboratory studies of the physiology of organ systems with special emphasis on endocrinology, cardiovascular, respiratory, and gastrointestinal physiology. Final exam. Prereq: Bio Sci 465. Sem hrs: 3 spring. Last offering: Spring 1977.

Bio Sci 495. Special Topics 1(1)
Selected topics in the biological sciences. Final exam or final report. Prereq: Department permission. Sem hrs and offering times determined by department (not more than 3 sem hrs).

Bio Sci 499. Independent Study 1-2(0)
Individual research in the biological sciences under the direction of a faculty member. Emphasizes the use of laboratory facilities. Research report. Prereq: Bio Sci 330; department permission. Sem hrs: 2 to 5 fall or spring.

Chemistry *(Chem)*

Offered by the Department of Chemistry and Biological Sciences

Chem 101-102. General Chemistry 1-1(2-2)
Atomic structure and its relation to chemical bonding, structure and periodic law concepts. Solution chemistry including acid-base theory, equilibria, and electrochemistry. Introduction to chemical kinetics, organic chemistry, qualitative analysis and thermochemistry. Laboratory experiments in chemical principles and processes. Final exam both semesters. Must be taken sequentially. Sem hrs: Chem 101 — 3 fall; Chem 102 — 3 spring.

Chem 121-122. Principles of Chemistry 1-1(2-2)
Atomic, molecular, and crystalline structure. States of matter. Chemical bonding. Equilibria and kinetics of chemical processes. Solution chemistry including acid-base theory, oxidation-reduction reactions, ionic equilibria, and electrochemistry. Properties of selected elements and their compounds. Introduction to chemical thermodynamics, qualitative analysis, and organic chemistry. Laboratory experiments in chemical principles and processes. Final exam both semesters. Must be taken sequentially. Sem hrs: Chem 121 — 3 fall; Chem 122 — 3 spring.

Chem 151. Accelerated General Chemistry 1(2)
Atomic structure, electron orbitals and their relationship to chemical bonding and chemical reactions. Gas equilibria and acid-base theory. Behavior of gases with atmospheric considerations. Thermochemistry including electrochemical cells and energy sources. Solution equilibria and applications to water pollution and marine chemistry. Kinetics and application to nuclear decay. Introduction to organic chemistry, chemistry of pesticides and selected drugs. No laboratory experiments. Students are chosen by the department on placement examination scores. Successful completion fulfills requirements for Chem 101-102. Final exam. Sem hrs: 3 fall plus 3 sem hrs validation credit for Chem 122.

Chem 222. Analytical Chemistry 1(2)
Laboratory instruction in classical and modern analytical measurements, supplemented with lectures which emphasize the principles involved in the laboratory. Final exam. Prereq: Chem 102, 122 or 151. Sem hrs: 3 spring.

Chem 233. Organic Chemistry I 1(1)
Classification and naming of organic compounds, reactions of aliphatic and aromatic compounds, stereochemistry, introduction to resonance, spectroscopy, and reaction mechanisms. Final exam. Prereq: Chem 102, 122 or 151; concurrent enrollment in Chem 243 is recommended but is optional for non-chemistry majors. Sem hrs: 3 fall.

Chem 234. Organic Chemistry II 1(1)
Continuation of the reactions of aliphatic and aromatic compounds and reaction mechanisms. Introduction to carbohydrates, polynuclear aromatics, heterocyclic compounds, amino acids and proteins, and multi-step syntheses. Final exam. Prereq: Chem 233; concurrent enrollment in Chem 244 is recommended but is optional for non-chemistry majors. Sem hrs: 3 spring.

Chem 243. Organic Chemistry I Lab 1(2)
Experiments in the preparation, purification and identification of typical organic compounds. Introduction to natural product extractions, infrared spectroscopy, and other instrumental techniques applicable

to organic compounds. Final exam. Prereq: Completed or enrolled in Chem 233. Sem hrs: 3 fall.

Chem 244. Organic Chemistry II Lab 1(2)

Experiments in qualitative organic analysis. Preparation, purification and identification of aromatic compounds, utilizing organic name reactions. Final exam. Prereq: Chem 243; completed or enrolled in Chem 234. Sem hrs: 3 spring.

Chem 335. Physical Chemistry I 1(1)

Chemical thermodynamics and equilibria; properties of gases, liquids, and solutions; phase equilibria; electrochemistry. Final exam. Prereq: Chem 102, 122 or 151; completion of any core math sequence. Sem hrs: 3 fall.

Chem 336. Physical Chemistry II 1(1)

Chemical kinetics, surface chemistry, ionic equilibria, introduction to quantum theory, molecular structure, and spectroscopy. Final exam. Prereq: Chem 335. Sem hrs: 3 spring.

Chem 345. Physical Chemistry I Lab 1(2)

Laboratory measurement of physical properties and processes including molecular weight determinations; thermodynamics of liquids and gases; thermochemistry of reactions and solutions; phase equilibria; homogeneous and heterogeneous chemical equilibria; colligative properties. Precision of measurement, statistical treatment of data and graphical techniques are emphasized. Final exam. Prereq: Completed or enrolled in Chem 335. Sem hrs: 3 fall.

Chem 346. Physical Chemistry II Lab 1(2)

Laboratory experiments in atomic and molecular properties, surface and transport phenomena; chemical kinetics; spectroscopy; radiochemical tracer techniques; high vacuum techniques. The use of modern instrumentation, the independent design and operation of experiments and technical accuracy are emphasized. Final exam. Prereq: Chem 345; completed or enrolled in Chem 336. Sem hrs: 3 spring.

Chem 381. Chemistry of the Environment 1(1)

Discussion of the nature, chemistry and alteration of the environment. Major areas of study include atmospheric and water pollution, waste disposal, geochemistry, limnology, oceanography, and special topics of current or regional interest. Emphasis placed on understanding the chemical principles and reactions involved in protecting and improving our environment. Final exam and report. Prereq: 1/C or 2/C standing. Sem hrs: 3 spring.

Chem 431. Theoretical Inorganic Chemistry 1(1)

Theoretical approach to atomic structure, covalent bonding and molecular structure; ionic compounds; oxidation potentials; acid-base theories; non-aqueous solvents. Final exam. Prereq: Chem 336. Sem hrs: 3 fall.

Chem 432. Systematic Inorganic Chemistry 1(1)

Applications of Chem 431 with emphasis on a systematic study of the behavior of chemical elements and their inorganic compounds. Chemistry of transition metals, organometallics, boron, bio-inorganics, and special topics. Final exam. Prereq: Chem 431. Sem hrs: 3 spring.

Chem 433. Advanced Organic Chemistry 1(1)

Molecular structure including resonance, stereochemistry and aromaticity. Inductive and steric effects on reaction rate and mechanisms. Application to nucleophilic substitutions, eliminations and other reaction types. Final exam. Prereq: Chem 234; Chem 336 or department permission. Sem hrs: 3 fall.

Chem 434. Biochemistry 1(1)

Chemistry of life processes including comparative biochemistry; chemical nature of biomolecules (carbohydrates, lipids, amino acids and proteins, nucleic acids and their components, porphyrins, chlorophyll, and enzymes); catabolism and anabolism; metabolic regulation; protein synthesis; biochemical genetics. The areas of vitamins, co-enzymes and enzyme cofactors, steroids, and mineral metabolism are covered as intimate parts of the mechanisms of the metabolic pathways. Final exam. Prereq: Chem 234; Chem 336 or department permission. Sem hrs: 3 spring.

Chem 435. Advanced Physical Chemistry 1(1)

Classical chemical thermodynamics. Extension of basic principles to real systems. Topics treated include gases, electrolytic and non-electrolytic solutions, surface systems, and galvanic cells. Final exam. Prercq: Math 351 recommended but not required; Chem 336. Sem hrs: 3 fall.

Chem 443. Advanced Physical Chemistry Lab 1(2)

Laboratory experiments including atomic and molecular properties; chemical kinetics; spectroscopy; radiochemical tracer techniques; high vacuum techniques. The use of modern instrumentation is emphasized. Final exam. Prereq: Chem 336; Chem 344. Sem hrs: 3 fall. Last offering: Fall 1976.

Chem 453. Instrumental Chemistry 1(2)

Advanced theory and use of modern analytical and research instruments. Subjects include spectroscopy, ultraviolet-visible emission and absorption, infrared, and nuclear magnetic resonance; x-ray; mass spectrometry; gas chromatography and electrochemical techniques. Emphasis on theory as applied in laboratory instrumentation. Final exam. Prereq: Chem 336. Sem hrs: 3 fall. First offering: Fall 1977.

Chem 495. Special Topics 1(1)

Selected topics in chemistry. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Chem 499. Independent Study *0-2(0)*
Individual research under the direction of a faculty member. Includes use of chemical literature. No final. Prereq: Chem 244 and 345; department permission. Sem hrs: 1 to 5 fall or spring.

Civil Engineering *(Civ Engr)*

Offered by the Department of Civil Engineering, Engineering Mechanics and Materials

Civ Engr 361. Fundamental Hydraulics *1(1)*
Application of the principles of incompressible fluid mechanics. Fluid properties, manometry, forces on submerged bodies, and conduit flow to include impulse-momentum and energy are included. Special topics include dynamic similitude, turbomachinery (well hydraulics and pumps) and the method of Hardy-Cross for balancing flow in water distribution systems. Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall.

Civ Engr 372. Behavior and Analysis of Structures *1(1)*
Introduction to design concepts. Behavior and analysis of statically determinate beams, frames and trusses due to various loadings and deflections. Approximate analysis of indeterminate structures. Displacements calculations by moment area and virtual work methods. Analysis of indeterminate structures by consistent deformations, moment distribution and matrix techniques. Final exam. Prereq: Mech 210 (362). Sem hrs: 3 spring.

Civ Engr 381. Engineering Measurements and Construction *1(1)*
Plane surveying and use of basic equipment including chain, level and transit. Field problems in measurement of distance, leveling, line direction and angle measurement. Construction as an industry, construction methods, equipment, materials and management techniques. The professional practice of engineering. Final exam. Sem hrs: 3 fall.

Civ Engr 392. Soil Mechanics *1(1)*
Engineering properties of soils and shear strength of cohesive and cohesionless soils, consolidation of soils and settlement of structures; stress distribution; lateral earth pressures on structures; ultimate bearing capacity; principles of foundation design. Selected laboratory exercises in soil testing. Final exam. Prereq: Mech 210 (362). Sem hrs: 3 spring.

Civ Engr 454. Structural Dynamics *1(1)*
Analysis of structures under dynamic loads. Rigorous analysis of single- and multi-degree-of-freedom systems including the development and use of response spectra. Introductory coverage of numerical and graphical integration, distributed mass systems, and elastoplastic behavior. Final exam. Prereq: Civ Engr 372 (451). Sem hrs: 3 spring.

Civ Engr 455. Reinforced Concrete Design *1(1)*
Design of reinforced concrete structural elements such as beams, columns, footings and slabs. Flexure, shear, tensile, compressive, anchorage, bond, creep and temperature change stresses are included in design problems. Ultimate strength design theory is emphasized. Final exam. Prereq: Civ Engr 451. Sem hrs: 3 fall. Last offering: Fall 1976.

Civ Engr 462. Water Supply and Waste Disposal *1(1)*
Design of systems for the collection, treatment and distribution of water and the follow-on collection, treatment and disposal of the resulting wastewater, as well as storm water runoff control. Special emphasis is placed on laboratory demonstrations of the analytical techniques employed for identifying common water pollutants and on wastewater treatment techniques and equipment. Final exam. Prereq: Civ Engr 361 (366). Sem hrs: 3 spring.

Civ Engr 463. Applied Wastewater Engineering *1(1)*
Fundamentals of aquatic ecology and the natural cycles of the Biosphere are reviewed with special emphasis placed on receiving stream management and the design of sewage treatment plants. Special topics include wastewater toxicity, receiving stream waste assimilative capacity, stream and effluent standards, aeration, activated sludge, aerated lagoons, waste stabilization ponds and anaerobic sludge digestion. Final exam. Prereq: Civ Engr 462 (352). Sem hrs: 3 spring.

Civ Engr 464. Civil Engineering Design *1(1)*
Individual or group design of civil engineering projects in the areas of structural, soils and environmental engineering design. Individual laboratory, experimental or analytic investigation in support of civil engineering design. Specialized topics in structural steel design, reinforced concrete design, structural dynamics, soil dynamics, aerospace facilities design, environmental quality control design, architectural design, and air base master planning may be studied. Students are individually supervised but must formulate their own investigation techniques and conclusions. Final report. Prereq: 1/C standing; engineering or science major; department permission. Sem hrs: 3 fall or spring.

Civ Engr 471. Behavior and Design of Concrete Members *1(1)*
Material properties of concrete, including mix design and testing of hardened concrete. Behavior and ultimate strength design of reinforced concrete structural elements such as beams, footings, columns and slabs. Flexure, shear, tensile, compressive, anchorage, bond and creep and temperature change stresses are included in design problems. Final exam. Prereq: Civ

Engr 372 (451). Sem hrs: 3 fall. First offering: Fall 1977.

Civ Engr 472. Behavior and Design of Steel Members *1(1)*

Behavior and working stress design of structural steel elements including tension, flexural and compression members. Design of riveted, bolted and welded steel connections for beams, columns and frames. Introduction to plastic design of beams and frames. Final exam. Prereq: Civ Engr 372 (451). Sem hrs: 3 fall.

Civ Engr 473. Structural Design *1(1)*

Design of a complete, multi-story steel and reinforced concrete building, including structural frame, floor system, wall system and foundation. Determination of design loads on multi-story structures. Use of digital computer for determination of internal forces due to design loads. Final report. Prereq: Civ Engr 372 (451); Civ Engr 471 (455); Civ Engr 472 (453). Sem hrs: 3 spring.

Civ Engr 481. Air Base Engineering *1(1)*

Principles of planning, land use regulatory measures, design considerations for airport and aviation system facilities emphasizing the interface of the aviation system with the urban and natural environment. The viewpoint of the base commander is stressed. Technical inputs for base commander's analysis are handled by computer software. Topics include airspace criteria, geometric design of airfield, zoning, noise abatement and pollution control. Final exam. Sem hrs: 3 spring.

Civ Engr 491. Foundation Engineering *1(1)*

Effects of sub-soil conditions and the behavior of soils on foundation types. Analysis and design of footings, pile foundations, retaining walls, piers, abutments, sheet piling and slope stability. Final exam. Prereq: Civ Engr 392 (441). Sem hrs: 3 fall.

Civ Engr 495. Special Topics *1(1)*

Selected topics in civil engineering. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Civ Engr 499. Independent Study *0-1(0)*

Individual study and research in an advanced civil engineering topic approved by the department head. Final report. Sem hrs: 1 to 3 fall or spring.

Computer Science *(Comp Sci)*

Offered by the Department of Astronautics and Computer Science

Comp Sci 100. Basic Programming in Science, Engineering and Management *1(1)*

Introduction to algorithms, programs and computers. Principles and concepts designed to provide the basic knowledge and experience necessary to use computers effectively to solve problems. Problem analysis and preparation and execution of numerical and nonnumerical programs for computer solution. Final exam. Sem hrs: 3 fall or spring.

Comp Sci 362. Computer Simulation *1(1)*

Theory of system modeling and computer simulation; simulation languages; queuing theory. Includes preparation of several computer programs and a group study of a real world problem. Final report. Prereq: Math 357 or Math 220 with department permission; Comp Sci 100 (200). Sem hrs: 3 spring.

Comp Sci 380. Data Structures *1(1)*

Basic concepts of data; description, representation and manipulation of information structures; basic operations on list structures and strings; file organization; data structures in programming languages. Preparation and execution of programs on the computer. Final project. Prereq: Comp Sci 100 (200). Sem hrs: 3 fall.

Comp Sci 381. Computers and Programming *1(1)*

Characteristics and organization of computers; computer languages; specific exercises in digital computer programming at an intermediate level. Programs are written in assembly language and higher level languages such as ALGOL, FORTRAN, and COBOL emphasizing improvement of programming techniques, applications, and advanced capabilities of the languages. Preparation and execution of computer programs. Final exam. Prereq: Comp Sci 100 (200). Sem hrs: 3 fall or spring.

Comp Sci 463. Information Retrieval *1(1)*

Techniques of designing and implementing data management systems including file organization, file maintenance, retrieval, selection of computer systems, and data structures. Includes individual preparation of computer programs and a group project designing an information system. Final report. Prereq: Comp Sci 380; completed or enrolled in Comp Sci 381. Sem hrs: 3 spring.

Comp Sci 483. Operating Systems *1(1)*

Design of supervisors for large multiprocessing systems. Topics include virtual memory, resource management and allocation, concurrent processes, protection, file systems, batch and interactive subsystems. Final report. Prereq: Comp Sci 381. Sem hrs: 3 fall.

Comp Sci 484. Programming Systems *1(1)*

Translators and interpreters for high-level programming languages. Program organization, grammars, scanners and recognizers. Design and construction of a syntax-directed compiler. Final report. Prereq: Comp Sci 380, 381. Sem hrs: 3 spring.

Comp Sci 485. Computer Architecture 1(1)
Logical design of computers and machine organization. The course examines the functional basis of various computer structures including memory devices, word structure and addressing, arithmetic units, and input/output equipment. Recent advances in computer organization. Includes several computer projects to illustrate basic concepts. Final report. Prereq: Comp Sci 100 (200). Sem hrs: 3 spring.

Comp Sci 495. Special Topics 1(1)
Selected topics in computer science. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Comp Sci 499. Independent Study 1-2(0)
Individual study and research supervised by a faculty member. Topic established with the department head. Final report. Sem hrs: 2 to 6 fall or spring.

Economics *(Econ)*

Offered by the Department of Economics, Geography and Management

Econ 201. Principles of Economics 1(1)
Introduction to the economic principles underlying the operation of the mixed enterprise economy of the United States. Includes both macroeconomic analysis of national income determination and stabilization policies and microeconomic analysis of decision making and markets. Final exam. Sem hrs: 3 fall or spring.

Econ 202. Economics of National Security ½(1)
Analysis of economic problems that bear upon national security. The principles of both microeconomics and macroeconomics are applied to problems of national defense decision making. Final exam. Prereq: Econ 201; concurrent enrollment in Mgt 203 (for scheduling). Sem hrs: 1½ fall or spring. First offering: Spring 1977.

Econ 212. Economics of National Security 1(1)
Emphasizes the application of theoretical analysis to achieve efficient allocation of resources in the nation's defense effort. Includes traditional microeconomics. Demand theory, production theory, and theory of the firm are analyzed. Final exam. Prereq: Econ 211; completed prior to the fifth semester. Sem hrs: 3 fall. Last offering: Fall 1976.

Econ 333. Price Theory 1(1)
Traditional microeconomic theory emphasizing the principles of product and factor pricing, allocation and employment of resources, and the implications of varying market structures. Investigates the usefulness of price theory in decision making. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall or spring.

Econ 350. International Economics 1(1)
Economic aspects of international relations. Includes the theory of international trade, relationships between national currencies under alternative international monetary systems, the balance of payments, commercial policy, and economic warfare. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall. (Offered Fall 1976, Fall 1977, Spring 1978 and spring only thereafter.)

Econ 351. Comparative Economic Systems 1(1)
Comparisons of the economic organization and institutions, and their impact on economic variables in Capitalistic, Market Socialistic, and Command economies. Historical and ideological backgrounds, industry labor, resources, trade, transportation, and problems of planning and rapid industrialization. Emphasizes the agricultural sectors, roles of the industrial manager, and the problems of incentives in the Soviet, Chinese, and European economies. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall.

Econ 373. Public Finance 1(1)
Nature of the private and public sectors; theory of public expenditures; nature of the budget system; sources of public revenues, principles and problems of taxation, personal income taxation, corporate income taxation, state and local taxation; theory of expenditure taxation. Final exam. Prereq: Econ 456 or department permission. Sem hrs: 3 fall.

Econ 374. Survey of International Economic Issues 1(1)
Examination of current issues in the commercial relations between advanced nations and in the relations between those nations and less-developed countries. Topics include the growth of international economic interdependence and the effects of tariffs and nontariff barriers to trade, effects and problems of regional integration, and international capital movements. This course is designed for cadets who are not majoring in either economics or management. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall or spring.

Econ 375. Monetary Economics 1(1)
Fundamental monetary concepts, history and development of financial institutions, and instruments of monetary economics. Use of tools and techniques of economic theory; analysis of determinants of interest rates and credit availability with special emphasis on current domestic and international issues of monetary policy. Field trip required. Final exam. Prereq: Econ 456 or department permission. Sem hrs: 3 spring.

Econ 452. Economic Problems of Developing Areas 1(1)

Theory and policy of economic development. Examination of classical and modern theories of development. The problems of accelerating development in developing countries and maintaining growth in advanced economies. Final exam. Prereq: Econ 350 or department permission. Sem hrs: 3 spring.

Econ 456. Macroeconomic Theory 1(1)

Analysis of the determination of level of national income and employment in terms of national income accounting and aggregative theory. Treats classical, Keynesian, and neo-Keynesian theories of income level, fluctuation and growth. Evolution of various economic policies designed to promote economic stability. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 spring.

Econ 465. Introduction to Econometrics 1(1)

Application of statistical tools to economic data. Includes methodology, econometrics model building, and statistical inference. Emphasizes the application of econometric theory to original empirical problems. Final exam. Prereq: Econ 202 (212); Mgt 331. Sem hrs: 3 fall. (Offered Fall 1976, Fall 1977, Spring 1978 and spring only thereafter.)

Econ 466. Seminar in Econometrics 1(2)

Continues development of model building and analytical tools and stresses their application to economic problems. Emphasizes individual and original research. Final exam. Prereq: Econ 465. Sem hrs: 3 spring. (Offered Spring 1977, Spring 1978, Spring 1979, Fall 1979 and fall only thereafter.)

Econ 472. Seminar in International and Development Economics 1(2)

A study of prominent major issues in international and development economics, utilizing economic theory in their analysis. Lectures on the relevant theory and area case studies. Emphasis on significant student participation in the form of research, presentation and discussion of papers. Student research may be oriented toward any geographical or theoretical area of interest in the realms of development and international economics. Final exam. Prereq: Econ 350, Econ 452, Econ 374 or department permission. Sem hrs: 3 spring.

Econ 477. Defense Economics 1(2)

Microeconomic methodology of systems analysis and cost effectiveness as involved in defense decision making; macroeconomic implications of the cold war, active warfare, R & D and Procurement expenditures, arms control, and disarmament. Reading supplemented by schedule of lectures by top defense analysts. Individual or group research into some area of defense economics is required. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall or spring.

Econ 479. Policy Issues in Contemporary Economics 1(2)

Application of economic theory to contemporary economic issues and policies. Includes methodology, income and employment, urban issues, racial discrimination, education, migration, income maintenance, and other selected domestic issues. Final exam. Prereq: Econ 202 (212); department permission. Sem hrs: 3 fall.

Econ 495. Special Topics 1(2)

Selected topics in economics. Final exam or final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

Econ 499. Independent Study 1-2(0)

Tutorial investigation of a specific area of economics. Final report. Sem hrs: 2 to 5 fall or spring.

Electrical Engineering *(El Engr)*

Offered by the Department of Electrical Engineering

El Engr 210. Digital Signals and Systems 1(1)

An introduction to the principles and processes which relate to digital electronic systems. Includes discrete signals, logic components, signal coding, and elementary information theory. Introduces information processing systems, such as the digital computer, on a component level. Treats transistors, diodes, and other electronic devices as they relate to switching circuits. Approaches the design of digital microsystems by programming integrated logic circuits. Laboratory projects include analysis of integrated circuits as applied to digital computer architecture. Lab. Final exam. Prereq: Math 133 (123). Sem hrs: 3 fall or spring.

El Engr 310. Electronic Circuits and Systems 1(1)

An introduction to electronics and electrical circuit theory. Treats traditional topics such as transients, load-line analysis, and biasing as they apply to modern devices such as the integrated circuit operational amplifier. Includes semiconductor physics, electron devices, sinusoidal steady-state analysis, and introductory system theory. Emphasizes continuous as opposed to digital electronic systems. Laboratory projects include work with integrated circuits. Lab. Final exam. Prereq: El Engr 210 (331) and Physics 211. Sem hrs: 3 fall or spring. First offering: Spring 1977.

El Engr 331. Electronic Signals and Systems I 1(1)

Emphasizes the principles and problems relevant to the processing of information by electronic means. Includes signal representation in the time and frequency domain and information content of signals. Also includes the characteristics and limitations of

both digital and analog microsystem signal processors. Lab. Final exam. Prereq: Completed or enrolled in Math 134 (221). Sem hrs: 3 fall or spring. Last offering: Fall 1976.

El Engr 332. Electronic Signals and Systems II 1(1)

Continuation of El Engr 331. Emphasizes the characteristics and limitations of both digital and analog macrosystems with application to communications, instrumentation, avionics, simulation and other areas. Lab. Final exam. Prereq: El Engr 331 in the preceding semester. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

El Engr 340. Circuit Analysis 1(1)

An introduction to electrical circuit analysis. Emphasizes a balanced treatment of both theoretical and applied analysis techniques. Topics covered include circuit components, connection equations and device relationships including operational amplifiers. The Laplace transform is introduced and used extensively as an analysis tool. Lab. Final exam. Prereq: El Engr 210 (331). Sem hrs: 3 fall or spring.

El Engr 341. Electronics I 1(1)

Introduction to semiconductor electronics. Includes analysis of semiconductor devices such as the diode and transistor. Applications of devices in electronic circuits are covered with emphasis on the diode and transistor. Lab. Final exam. Prereq: El Engr 310 (332) or completed or enrolled in El Engr 340. Sem hrs: 3 fall.

El Engr 342. Electronics II 1(1)

A continuation of El Engr 341. Covers the theory and application of semiconductor devices and integrated circuits with emphasis on principles of operation. Lab. Final exam. Prereq: El Engr 341. Sem hrs: 3 spring.

El Engr 351. Laboratory Techniques 0(0)

Practical application of electronic test equipment and laboratory techniques. Includes basic electrical measurements. Emphasis on the diode and transistor as circuit elements. Lab. Prereq: Enrolled in El Engr 341. Sem hrs: 1 fall.

El Engr 352. Electronics Laboratory 0(0)

Practical application of semiconductor devices and integrated circuits. Emphasis on circuit construction and verification of device parameters. Lab. Prereq: Enrolled in El Engr 342. Sem hrs: 1 spring.

El Engr 360. Instrumentation Systems 1(1)

Principles of modern data acquisition and instrumentation systems. Includes measurement techniques, transducers, analog and digital data processing systems and displays. Lab. Final exam. Prereq: El Engr 340 or Engr 350. Sem hrs: 3 fall or spring. First offering: Spring 1977.

El Engr 380. Modern Logic Design 1(1)

An introduction to the design of digital systems. Topics include digital integrated circuits, combinatorial logic, sequential logic, programmable logic arrays, microprogramming and state controllers. Lab. Final exam. Prereq: El Engr 210 (331). Sem hrs: 3 fall or spring. First offering: Spring 1977.

El Engr 381. The Digital Computer as a Laboratory Instrument 1(1)

Real time use of digital computers in hybrid instrumentation and control. "Hands-on" experience is provided using a computer as a dedicated system component for real-time transforms, and signal processing. The introductory material covers machine organization and operation, machine language programming, and interrupt processing. Lab. Final project. Prereq: Comp Sci 100 (200) or department permission. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

El Engr 441. Instrumentation Systems 1(1)

Principles of modern data acquisition instrumentation including metrology, transducers, sensors, displays, and digital and linear instrumentation data system organization and operation. Lab. Final exam. Prereq: El Engr 332 or El Engr 341. Sem hrs: 3 fall or spring. Last offering: Fall 1976.

El Engr 443. Electromagnetics I 1(1)

Classical boundary value problems in static electric and magnetic fields. Introduction to time-changing fields. Relationship established between field and circuit theory. Lab. Final exam. Prereq: Physics 311 (212). Sem hrs: 3 fall. First offering: Fall 1977.

El Engr 444. Electromagnetics II 1(1)

Maxwell's equations and their application to transmission lines, waveguides, and antennas. Plane waves in dielectric and conducting media. Lab. Final exam. Prereq: El Engr 443. Sem hrs: 3 spring. First offering: Spring 1978.

El Engr 445. Discrete Signals and Systems 1(1)

Analysis of discrete-time signals and systems. Material includes a review of continuous systems analysis techniques. Topics covered are sampling, convolution, z-transforms, discrete transfer functions, discrete system response, and digital filtering. Emphasizes both theory and application. Lab. Final exam. Prereq: El Engr 340 or Math 351. Sem hrs: 3 fall.

El Engr 446. Continuous Signals and Systems 1(1)

Analysis of signals and linear systems in the time and frequency domain. Topics covered include convolution, Fourier and Laplace transforms, state-space concepts, sampling, non-deteministic analysis, filter theory, and overview of discrete analysis techniques. Applications are taken from electrical engineering. Lab. Final exam. Prereq: El Engr 340 or Math 351. Sem hrs: 3 fall. First offering: Fall 1977.

El Engr 447. Communications Systems 1(1)
An introduction to modern electrical communications and information transfer from a systems viewpoint. Design considerations and comparative performance of various modulation and detection methods are analyzed. Coverage includes theory of operation, effects of random noise, bandwidth constraints, and multiplex capabilities of analog and digital transmission systems. Lab. Final exam. Prereq: El Engr 446 (346). Sem hrs: 3 fall or spring. Offered: Fall 1976; Spring 1978 and spring only thereafter.

El Engr 464. Design 1(1)
The integration of advanced concepts in electronics, instrumentation, signal processing, and microcomputer hardware with production and management methods as practiced in the USAF. Emphasis is placed on developing design techniques for the application of electrical engineering technology to defense problems. Lab. Final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

El Engr 465. Design Laboratory 1(0)
The laboratory study of advanced concepts in electrical engineering technology to include metrology, manufacturing techniques, and the completion of a design project. Lab. Final project. Prereq: Enrolled in El Engr 464. Sem hrs: 1 fall or spring. First offering: Fall 1977.

El Engr 480. Studies in Military Electronics 1(1)
An introductory course in military electronics for non-electrical engineering majors. Course topics selected from such areas as electronic warfare, radar, Air Force communications, etc. Final exam. Prereq: 1/C standing and department permission. Sem hrs: 3 fall or spring.

El Engr 487. Real-Time Computation 1(1)
An introduction to real-time computation using a microprocessor-based data acquisition system. Topics include structured system development, microprocessor instruction sets, support software, and hardware-software relationships and techniques. Lab. Final exam. Prereq: El Engr 380 or department permission. Sem hrs: 3 fall. First offering: Fall 1977.

El Engr 488. Microprocessor Systems 1(1)
Analysis and design of dedicated microprocessor systems. Includes interfacing, computer architecture, design methodology and related laboratory techniques. Lab. Final project. Prereq: El Engr 445; El Engr 487. Sem hrs: 3 spring. First offering: Spring 1978.

El Engr 495. Special Topics 1(1)
Selected topics in electrical engineering. Final project. Prereq: department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

El Engr 499. Independent Study 1-2(0)
Individual study and research in an engineering design topic approved by the department head. Final paper and oral report. Sem hrs: 3 to 6 fall or spring.

Engineering *(Engr)*

Offered by various departments and divisions as noted

Engr 350. Linear Systems Analysis 1(2)
Modeling of physical systems. Joint study of mechanical and electrical systems described by linear first and second order differential equations with constant coefficients. Electrical analogies, frequency response, introduction to Bode plots, and introduction to the analog computer. Includes operation of linear computer elements and readout devices, programming, selecting maximum values, magnitude scaling, time scaling, static check, and program check. Lab. Final project. Prereq: Physics 211; completed or enrolled in Mech 320 (361). (*Administered by the Department of Astronautics and Computer Science with instructors from all Engineering Science Departments.*) Sem hrs: 3 fall or spring.

Engr 402. Professional Engineering Development 0(1)
Review of mathematics, chemistry, physics, and engineering sciences in preparation for the Colorado Engineer-in-Training examination. Taking the exam is optional at end of course. Prereq: 1/C standing; Basic or Engineering Science major. (*Administered by Department of Civil Engineering, Engineering Mechanics and Materials.*) Sem hrs: 0 spring.

Engr 430. Engineering Systems Design 1(1)
Application of the various engineering disciplines to overall systems analysis and design. Includes introduction of basic concepts of instrumentation and control applied to mechanical, electromechanical and aeromechanical systems. Design projects include attention to economics and management aspects of the design process. Final report. Prereq: Mech 210 (362); Aero 312 (332); El Engr 310 (332); Comp Sci 100 (200); Astro 332 desirable. (*Administered by the Department of Astronautics and Computer Science with instructors from all Engineering Science departments.*) Sem hrs: 3 fall and spring. First offering: Spring 1979.

Engr 451. Engineering Applications of Digital Computers 1(1)
A study of computer oriented methods to solve a wide range of problems in the engineering sciences. Includes predictor - corrector integration schemes, Gauss-Seidel iteration, least squares, finite difference formulation, statistical methods, and other topics. Selected problems solved via the digital computer. Final project. Prereq: Math 351 or Math 341. 1/C

or 2/C standing with department permission. (*Administered by Department of Astronautics and Computer Science.*) Sem hrs: 3 fall or spring.

English *(English)*

Offered by the Department of English and Fine Arts

English 001. English as a Second Language *0(0)*

A tutorial course for fourth class Allied Students to increase oral and written competencies requisite for completion of English 111 and 212 (112). Pass/Fail grades to be entered on student's transcript. No final. Non-credit. Sem hrs: 0 summer.

English 111. English Composition *1(1)*

Reinforcement of basic writing skills and introduction to rhetoric, with frequent practice in expository writing. Final exam. Sem hrs: 3 fall or spring.

English 212. Composition and Speech *1(1)*

Combines a continuation of English 111 with instruction in public speaking and military briefings. Emphasizes a laboratory approach with frequent writing exercises and speaking performance. Final exam. Prereq: English 111. Sem hrs: 3 fall or spring. First offering: Fall 1977.

English 330. Technical Writing *1(1)*

Practical workshop approach to the study of communicating technical information. Frequent exercises to develop effective skill in audience analysis and to provide groundwork for a report in a scientific or engineering field. Final report. Prereq: English 212 (112). Engineering and Basic Science majors; 2/C standing: Sem hrs: 3 fall or spring.

English 340. The English Novel *1(1)*

A tutorial course which surveys representative English novels from 1700 to 1940. Novels read in the course typically include works by Defoe, Fielding, Sterne, Austen, the Brontes, Dickens, Eliot, Hardy, Conrad and Woolf. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 350. Advanced Composition *1(1)*

Practical workshop approach emphasizes professional communications techniques in academic and military subjects. Frequent written exercises develop necessary skills in audience analysis and effective style and illustrate fundamentals or proper preparation and execution of advanced writing projects. Final report. Prereq: English 212 (112). Humanities and Social Science majors; 2/C standing. Sem hrs: 3 fall or spring.

English 353. Shakespeare *1(1)*

Intensive study of several of Shakespeare's major plays. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 360. Classical Readings *1(1)*

Tutorial course in Greek, Roman, and Medieval Literature. Investigation of the origins of literary forms such as biography, epic, satire, history, essay, and heroic romance. Preliminary study of Greek, Roman, Nordic, and European mythologies, and the sagas of medieval heroes such as Arthur, El Cid, and Gawain. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 370. Speech *1(2)*

Instruction and practice in public address, including informative, argumentative, and persuasive speaking. Emphasizes a workshop approach with individual coaching; frequent audio and video taping sessions. Open to all cadets. No final. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 406. Values in Western World Literature *1(1)*

Written and oral analysis of important human values embodied in selected western world masterpieces from the Renaissance through the moderns. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 431. English Literature *1(1)*

Reading of the best work of major British writers. Includes a survey of the principle forms and periods of English literature from early times through modern. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 442. Modern Literature *1(1)*

A representative study of modern literature drawn from European, British, African, Canadian, Latin American, and American authors, usually emphasizing but not restricted to novels. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 471. American Literature I: Beginnings to Naturalism *1(1)*

A survey of American fiction, poetry, drama, and prose by such authors as Jefferson, Irving, Poe, Hawthorne, Melville, Whitman, Twain, and Dickinson. Final exam. Prereq: English 212 (112). Sem hrs: 3 fall.

English 472. American Literature II: Naturalism to the Present *1(1)*

A continuation of the survey of American fiction, poetry, drama, and prose by such writers as Robinson, Eliot, Frost, O'Neill, Fitzgerald, Faulkner, Hemingway, Wright, and selected contemporary authors. Final exam. Prereq: English 212 (112) (English 471 recommended). Sem hrs: 3 spring.

English 495. Special Topics *1(1)*

Selected special topics in English. Previous topics have included Satire, Black Literature, the Literature of the Supernatural, Creative Writing, Science Fiction, and the Literature of Film. Fall 1976 offering: Man in Conflict: The Literature of Battle. Spring 1977 offering: Existential Voices in Modern Literature. Final Exam. Prereq: English 212 (112). Sem hrs: 3 fall or spring.

English 499. Independent Study *1(0)*

Study and research in literature or creative writing. Subject and meetings arranged with the instructor. Final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

Fine Arts *(Fine Art)*

Offered by the Department of English and Fine Arts

Fine Art 105, 205, 305, 405. Drum and Bugle Corps *0(0)*

Introduction to military music traditions and procedures. Intensive rehearsal and drill in techniques of precision marching while playing. Instruction and participation in planning public performances. Cadets in Fine Art 205 and 305 assume responsibility for section leadership and lower echelons of command. Cadets in Fine Art 405 assume upper echelon leadership and command of corps. Upon withdrawal or completion, cadets will participate in squadron competitive athletics. Pass/Fail. No final. Prereq: Audition and department permission. Sem hrs: 1 fall.

Fine Art 451. Introduction to the Visual Arts *1(1)*

Discussion and analysis of major art concepts, artists, and styles. Emphasis on development of potential for esthetic and creative experience, including a brief survey of the evolution of art styles and a studio project in painting. Demonstrated artistic ability or prior knowledge of art not required. Final exam. Sem hrs: 3 fall or spring.

Fine Art 458. Music Appreciation *1(1)*

Survey of music of the Western world through a study of basic elements, forms, and styles in representative works by major composers. Emphasis on listening, understanding, and appreciation. Voluntary field trips to selected area concerts. Technical knowledge or talent in music not required. Final exam. Sem hrs: 3 fall or spring.

Fine Art 460. Fine Arts Studio *1(2)*

Introductory experiences in design, graphics, painting, sculpture, and mass communications. Media explored are woodcuts, etchings, oils, synthetics, wood, stone, bronze, and direct metal. Prior experience in artistic media not required. No final. Prereq: Fine Art 451 or Fine Art 477. Sem hrs: 3 spring.

Fine Art 477 American Art and Music *1(1)*

Survey from the Colonial period to the present. Considers American aspects of music and art, with reference to visual and aural communication, regional and national means of expression, and the influence of American currents of thought on specific periods and individual styles, including contemporary artists and composers. Technical knowledge or ability in music or art not required. Final exam. Sem hrs: 3 fall.

Fine Art 499. Independent Study *1(0)*

Independent study in the field of art or music. Subject and meetings arranged with the instructor. No final. Prereq: For visual art, Fine Art 451 and Fine Art 460 plus department permission; for music, Fine Art 458 and department permission. Sem hrs: 3 fall or spring.

Foreign Languages *(For Lang)*

Offered by the Department of Foreign Languages

For Lang 111. *½(2)*

Arabic 111	*Basic Arabic* I
Chinese 111	*Basic Chinese* I
French 111	*Basic French* I
German 111	*Basic German* I
Japanese 111	*Basic Japanese* I
Russian 111	*Basic Russian* I
Spanish 111	*Basic Spanish* I

Introduction to target language with emphasis on communicative skills. Drills in grammar and structure. Language laboratory supplements classroom instruction. Final exam. Sem hrs: 1½ fall.

For Lang 112. *½(2)*

Arabic 112	*Basic Arabic* II
Chinese 112	*Basic Chinese* II
French 112	*Basic French* II
German 112	*Basic German* II
Japanese 112	*Basic Japanese* II
Russian 112	*Basic Russian* II
Spanish 112	*Basic Spanish* II

Continuation of For Lang 111. Introduction of aural/reading comprehension and culture and civilization of language studies. Video grammar and TV cultural capsules supplement classroom instruction. Final exam. Prereq: For Lang 111. Sem hrs: 1½ fall.

For Lang 113. *½(2)*

Arabic 113	*Basic Arabic* III
Chinese 113	*Basic Chinese* III
French 113	*Basic French* III
German 113	*Basic German* III
Japanese 113	*Basic Japanese* III

Russian 113 — *Basic Russian* III
Spanish 113 — *Basic Spanish* III

Continuation of For Lang 112. Review of basic grammar and structure. Emphasis on aural/reading comprehension, and functional use of language. Final exam. Prereq: For Lang 112. Sem hrs: 1½ fall or spring.

For Lang 114. *½(2)*

French 114 — *Basic French* IV
German 114 — *Basic German* IV
Russian 114 — *Basic Russian* IV
Spanish 114 — *Basic Spanish* IV

Continuation of For Lang 113. Intensification of aural and reading comprehension. Student talks and classroom discussions based on readings in culture and civilization of language studied. Final exam. Prereq: For Lang 113. Sem hrs: 1½ fall or spring.

For Lang 115. *½(2)*

French 115 — *Basic French* V
German 115 — *Basic German* V
Spanish 115 — *Basic Spanish* V

Continuation of For Lang 114. Intensification of grammatical and syntactical accuracy, both in speech and writing. Final exam. Prereq: For Lang 114. Sem hrs: 1½ spring.

For Lang 221. *1(1)*

Chinese 221 — *Intermediate Chinese* I
French 221 — *Intermediate French* I
German 221 — *Intermediate German* I
Japanese 221 — *Intermediate Japanese* I
Russian 221 — *Intermediate Russian* I
Spanish 221 — *Intermediate Spanish* I

Review of grammar and structure of contemporary target language with emphasis on grammatical and syntactical accuracy in both speech and writing. Intensification of aural and reading comprehension. Student talks and classroom discussions based on selected readings in culture and civilization of language studied. Language laboratory supplements classroom instruction. Final exam. Prereq: Successful completion of For Lang 113 or 114 (102) (122) (151), or department permission. Sem hrs: 3 fall or spring.

For Lang 222. *1(1)*

Chinese 222 — *Intermediate Chinese* II
French 222 — *Intermediate French* II
German 222 — *Intermediate German* II
Japanese 222 — *Intermediate Japanese* II
Russian 222 — *Intermediate Russian* II
Spanish 222 — *Intermediate Spanish II*

Continuation of essential elements of language structure. Emphasis on conversational practice and aural comprehension of contemporary spoken language. Student talks and classroom discussions based on culture and civilization readings/topics in target language. Language laboratory supplements classroom instruction. Final exam. Prereq: successful completion of For Lang 115 or 221 (253) or department permission. Sem hrs: 3 fall or spring.

For Lang 223. *1(1)*

Chinese 223 — *Interemediate Chinese* III
French 223 — *Intermediate French* III
German 223 — *Intermediate German* III
Japanese 223 — *Intermediate Japanese* III
Russian 223 — *Intermediate Russian* III
Spanish 223 — *Intermediate Spanish* III

Continuation of essential elements of language structure. Emphasis on reading comprehension/translation based on scientific and social science reading materials in contemporary target language. Intensification of grammatical syntactical accuracy in writing. Course is designed to develop a facility for using language studied as a research tool. Final exam. Prereq: Successful completion of For Lang 222 (254) or department permission. Sem hrs: 3 fall or spring.

For Lang 365. *1(1)*

French 365 — *Advanced French*
German 365 — *Advanced German*
Russian 365 — *Advanced Russian*
Spanish 365 — *Advanced Spanish*

Oral discussion of issues in the civilization and culture of the country or countries concerned based on selected readings in the target language. Final exam. Prereq: Successful completion of For Lang 223 (255) or department permission. Sem hrs: 3 fall or spring.

For Lang 376. *1(1)*

French 376 — *Contemporary Literature*
German 376 — *Contemporary Literature*
Spanish 376 — *Contemporary Literature*

Study of important writers, their works, and influences on their societies. Final exam. Prereq: For Lang 365 or department permission. Sem hrs: 3 fall or spring.

For Lang 491. *1(1)*
French 491 — *French AFA Preparation I*

Intensive program in French for prospective candidates for the French Air Force Academy Exchange Program. Designed to provide required fluency in advanced conversation and reading/translation (with special emphasis on scientific texts). Final exam. Prereq: French 223 (255) or department permission. Sem hrs: 3 spring.

For Lang 492. *3(0)*
French 492 — *French AFA Preparation II*

Continuation of French 491. Intensive program stressing everyday conversation and scientific vocabulary. Includes advanced composition, translations and development of note-taking skills in the language. Final

exam. Prereq: French 491 and nomination by the Dean of the Faculty for participation in the French Air Force Academy Exchange Program. Sem hrs: 8 summer only.

For Lang 495. Special Topics *0-2(1)*

Selected topics in foreign languages. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department.

For Lang 499. Independent Study *1(0)*

Individual study or research conducted on a tutorial basis. Study may be in any of the six languages offered by the department. Topic or area of study/research must be approved by the department head. Final exam or term paper. Sem hrs: 3 fall or spring.

Supplementary Information

All cadets who have a background in one of the foreign languages offered at the Academy will be administered a placement examination in that language when they come to the Academy. Based on the results of that examination, a cadet may:

1. Receive validation credit for the languages core requirement (4½ sem hrs) or:
2. Be placed into one of the Basic course sequences (For Lang 111, 112, or 113) and required to take 4½ sem hrs.

Cadets without prior language background will be placed into For Lang 111 (Elementary Basic Sequence) of the language they wish to study. Cadets with one or two years of previous study of the language will normally be placed into For Lang 112 (Accelerated Basic Sequence); those with two or more years will be placed into For Lang 113 (Advanced Basic Sequence). For Lang 111 through 115 will meet for a double period every other day.

Geography *(Geog)*

Offered by the Department of Economics, Geography and Management

Geog 242. Analytical Techniques in Geography *1(1)*

Introduction to the "scientific method." Examines techniques in spatial and locational analysis to include quantitative and cartographic methods in geography. Specific problems representative of various subfields of geography are analyzed through application of these techniques. Final exam. Prereq: Geography major or department permission. Sem hrs: 3 spring.

Geog 320. Principles of Geography *1(1)*

Geographic analysis of major world regions applying principles of physical and cultural geography to spatial patterns observed in the physical and cultural landscape. Comparison of regional associations evolving from the synthesis of man's natural and cultural environment. Final exam. Sem hrs: 3 fall or spring. First offering: Fall 1977.

Geog 340. Cartography *1(2)*

An introduction to concepts and methods of cartography. Includes history, earth geometry, reference systems, map projections and grids, map compilation, computer and statistical maps, map reproduction and a limited exposure to applications of aerial photo interpretation. Lab required. Final exam or final project. Sem hrs: 3 fall.

Geog 350. Cultural Geography *1(1)*

A geographic analysis of cultural factors affecting the nature and distribution of population, settlements, and economic patterns. The processes of cultural change are considered in the development of primitive cultures to industrialized societies. Final exam. Sem hrs: 3 spring.

Geog 352. Climatology *1(1)*

An analysis of the parameters governing the distribution of and the dynamic processes that control the earth's regional climates. Focuses on regional climatic types, anomalies and meteorological controls. Final exam. Sem hrs: 3 fall.

Geog 353. Physical Geography *1(2)*

An analysis of the dynamic processes, distribution and structure of the earth's physical features. Focuses on fundamental concepts of physical geology, geomorphology, climate, soils and vegetation. Includes laboratory and local field trips within the Rocky Mountain region. Final exam. Sem hrs: 3 spring.

Geog 370. Political Geography *1(1)*

Analysis of the spatial structure and processes of political systems at the level of the community, within national systems, and among nations. Examines geographic problems and processes of politically organized space including such topics as nationalism, development, and acquisition of natural resources. Final exam. Sem hrs: 3 spring.

Geog 372. Economic Geography *1(1)*

Examines the physical, political, and demographic environments as they relate to the location of economic activity. Introduction to the institutional and theoretical approaches to the study of economic geographic phenomena. Special attention to contemporary industrial and commercial development. Field trips required. Final exam. Sem hrs: 3 fall.

Geog 382. Geographic Application of Imagery Analysis *1(2)*

Principles and employment of remote sensing systems which obtain imagery in the visible and non-visible portions of the electromagnetic spectrum; rectification of imagery for detailed landform analysis; application of imagery to cultural and physical geographic analy-

sis and cartography. Case studies and class projects focus on direct application of empirical data. Lab required. Final exam or project. Sem hrs: 3 spring.

Geog 471. Western Europe and the Mediterranean 1(1)

Geographical analysis of the physical and cultural aspects of Western Europe and the Mediterranean. Emphasis on the urban character of Europe and the region's inter-relationships with the rest of the world. Discussion of European countries' various political, economic, and cultural ties will be linked to problems and accomplishments of the peoples of Europe. Final exam. Sem hrs: 3 fall.

Geog 472. USSR and Eastern Europe 1(1)

Geographic analysis of the physical, cultural and economic base of the Soviet and East European socialist states. Topical analyses include assessment of the environmental base, nature and extent of resource utilization, and spatial interaction. Concepts of classification and regionalization are applied throughout the course. Final exam. Sem hrs: 3 spring.

Geog 475. Geography of the Developing World/East Asia and Latin America 1(1)

Geographic analysis of the physical and cultural landscapes of selected regions of the developing world. Investigates the regional distribution of resources, economic structure, industrial strength, and settlement patterns. Focuses on developmental problems with respect to population growth, cultural divergence, social and political instabilities. Department will select a specific region for areal focus; emphasis on Latin America in odd-numbered years and on Far East in even-numbered years. Final exam. Sem hrs: 3 fall.

Geog 491. Seminar on Basis of Geographic Thought and Research 1(1)

Examines the development of geographic thought. Investigates changes in research tools and techniques over time. Includes an extensive exposure to the "scientific method." Directs the student in completing a substantive, empirical research report. Field research or its equivalent required. Final exam. Prereq: Department permission. Sem hrs: 3 fall.

Geog 495. Special Topics 1(1)

Selected topics in geography. Field trips dependent upon topics. Final exam or final report. Semester hours and offering time determined by department (not more than 3 sem hrs).

Geog 499. Independent Study 1-2(0)

Independent research and study in specific area of geography conducted on a tutorial basis. Term paper or final project. Prereq: 1/C standing and minimum 3.00 GPA or department permission. Sem hrs: 2 to 5 fall or spring.

History *(History)*

Offered by the Department of History

History 101. Europe and the World Since 1500 1(1)

Main trends in world history from 1500 to the present. Emphasizes the emergence of Western Europe to a position of world dominance by the late 19th Century and its subsequent decline. Introduction to predominant characteristics of Latin American, Middle Eastern, African, and Far Eastern civilizations. Final exam. Sem hrs: 3 fall or spring.

History 200. History of the United States 1(1)

Survey of United States history from the colonial era to the present. Emphasizes political, social, economic and cultural developments in a world context. Final exam. Prereq: Department permission. Sem hrs: 3 fall. Last offering: Fall 1976.

History 202. Modern Warfare and Society 1(1)

Survey of the complex relationship between warfare and society from the American and French revolutions through the Vietnam war. The role of the military leader, the impact of technology, the evolution of military doctrine, and the development of air warfare are related to the changing character of warfare. Final exam. Prereq: History 101 (200) or (201). Sem hrs: 3 fall or spring.

History 300. The United States in a Changing World: Critical Issues 1(1)

Examines the historical development of critical issues confronting American society today including the role of minorities in American life, the impact of industrialism, expansion of the role of the federal government, the evolution of the city, the quality of life, and America's response to crucial world problems. Final exam. Prereq: History 101 (201). Sem hrs: 3 fall or spring. Last offering: Spring 1978.

History 303. The United States in a Changing World: Critical Issues 1-2(1X)

Examines the historical development of selected critical issues confronting contemporary American society. Issues considered include the role of minorities in American life, the impact of industrialization, the expansion of the role of the federal government, and America's response to crucial world problems. Final exam. Prereq: History 101 (201) and 202. Sem hrs: 1½ fall or spring.

History 330. Historical Methods 1(1)

Methods of historical research, analysis, evaluation, and writing. Term paper. Prereq: History major or department permission. Sem hrs: 3 fall or spring.

History 332. United States Diplomatic History 1(1)

Emphasizes emergence of the United States as a world power and the associated problems. Examination of diplomatic policies and their objectives and the novel factors which have influenced the conduct of diplomacy. Final exam. Prereq: History 101 (201). Sem hrs: 3 fall.

History 341. History of Latin America 1(1)

The discovery, conquest, and growth of Spanish and Portuguese America. Emphasizes political, social, economic, and cultural institutions since the wars of independence with particular stress on Twentieth Century problems. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 343. History of the Far East 1(1)

Modern history of East Asia with emphasis on China and Japan. The fundamental cultural developments; implications of contemporary tensions; the political, social, and economic results of Nineteenth and Twentieth Century relationships with Western powers. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 344. Origins of Modern Europe 1(1)

The political, social, economic, and military history of Europe from the early Middle Ages to the French Revolution. Primary emphasis is on the development of institutions and ideas that determined the course of European history and shaped our own era. Final exam. Prereq: History 101 (201). Sem hrs: 3 fall.

History 345. Modern European History 1(1)

The political, social, economic, and military history of Europe from the French Revolution to the present. Emphasis is on the following: crucial forces, such as nationalism, socialism, and the industrial revolution; the origins and results of the two world wars; key personalities of the era; the development of contemporary Europe. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 346. History of Russia 1(1)

Survey of Russian domestic and foreign affairs from the Ninth Century to the present Soviet regime. Emphasis on political, social, economic, and cultural developments since 1801. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 363. Unconventional Warfare 1(1)

Evolution, theory and practice of insurgent and revolutionary warfare throughout the world with special attention given to Southeast Asia. Unconventional warfare studied in terms of historical perspective, major philosophies involved and actual insurgencies. Examination of counterinsurgency operations in various areas and circumstances. Final exam. Prereq: History 202. Sem hrs: 3 spring.

History 371. Air Power and Modern Warfare 1(1)

History of the air weapon with primary emphasis on leadership and tactics as they evolved during the Twentieth Century. Covers both the United States and Europe stressing the constant interplay between personalities, institutions, theories, technology, combat experience, and evolving doctrine. Final exam. Prereq: History 202. Sem hrs: 3 fall.

History 372. History of the Middle East and Africa 1(1)

Survey of the history of the Middle East and Africa with emphasis on ethnic, cultural and religious development and growth of major problems in the modern period. Topics include early empires, impact of Islam, European imperialism and ethnic nationalism. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 382. History of Science and Technology 1(1)

Historical investigation of the meaning and impact of the scientific revolution, the industrial revolution, and science and technology in the Western World. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 457. History of Military Thought 1(1)

Historical investigation of the ideas of selected major military thinkers from the time of Machiavelli to the present. Emphasis is on those writers whose impact on evolving strategy and doctrine, whether on land, sea, or in the air, has been most far-reaching. Final exam. Prereq: History 202. Sem hrs: 3 fall.

History 479. American Institutions and Ideas 1(1)

Historical investigation of the development of American thought, attitudes, and institutions from the colonial period to the present. Final exam. Prereq: History 101 (201). Sem hrs: 3 spring.

History 481. History of Minorities 1(1)

Course is designed to provide an understanding of how minorities have been treated in the past in the United States. Covers the relationship of the various racial, religious, and ethnic minorities to an evolving American society. The emphasis is on the development of prejudice, the problems of assimilation, and the treatment of Blacks. Final exam and final report. Prereq: 3/C standing or higher. Sem hrs: 3 fall.

History 494. The American Way of War 1(1)

Course treats America's wars and warriors from Bunker Hill to Linebacker II. Primary attention is on how Americans have fought their wars. Also considered are why America went to war, the raising of armed forces, and the reactions to the effects of war. Particular emphasis is given to the role of lead-

ership, both civil and military. Final exam. Prereq: History 202. 1/C standing or department permission. Sem hrs: 3 spring.

History 495. Special Topics *1(1)*

Selected topics in history. Final exam/final report. Prereq: History 101 (201). Sem hrs: 3 fall or spring.

History 499. Independent Study *1(1)*

Reading and research in any recognized area of historical study. Areas selected by instructor depend on student interest. Term paper. Prereq: History majors must have taken History 330; all other department permission. Sem hrs: 3 fall or spring.

Humanities *(Hum)*

Offered by the Department of Foreign Languages

Hum 461. Russian Literature *1(1)*

A study of representative Russian authors (such as Pushkin, Chekhov, Dostoevsky, Tolstoy, Sholokhov, Pasternak, and Solzhenytsyn) in their historical and cultural setting and their impact on the shaping of the national character of the Russian people. Final exam. Sem hrs: 3 fall.

Hum 463. Far Eastern Literature *1(1)*

An historical survey and analysis of major literary works of the Far East with emphasis on China and Japan. Final exam. Sem hrs: 3 fall.

Hum 499. Foreign Exchange Study *5(0)*

One semester enrollment as a full-time student at an Allied Air Force Academy. In addition to formal study, the course will include visits to military installations and historical and cultural areas of the host country. Term paper and report. Prereq: Dean of the Faculty permission. Sem hrs: 15 fall or 15 spring.

Instructional Technology *(Inst Tch)*

Offered by the Directorate of Instructional Technology

Inst Tch 101. Academic Skills *0(1)*

Organization of study time, note taking, study methods, preparing for examinations, and development of listening skills. Improvement of reading skills to include general rate increases while maintaining and improving comprehension levels, as well as proper reading approaches in the content areas. Final exam. Pass/Fail. Sem hrs: ½ fall.

Inst Tch 102. Basic Typing *0(1)*

Basic typing limited to skills needed for theme, report, and military/personal correspondence typing. Final exam. Pass/Fail. Sem hrs: ½ fall.

Law *(Law)*

Offered by the Department of Law

Law 210. An Introduction to Law *1(1)*

An introduction to the substance and administration of law, including the judicial process and legal reasoning. Examines how stability is maintained, disputes are resolved and freedom protected through law, by studying the principles of contracts, property and torts. Final exam. Prereq: 3/C or 2/C standing. Must be completed prior to a cadet's seventh semester. Sem hrs: 1½ fall or spring. Offered only to Classes of 1977 and 1978. Last offering: Spring 1977.

Law 300. An Introduction to Law *1(1)*

An introduction to the substance and administration of law, including the judicial process and legal reasoning. Examines the relationship between law and social order, how disputes are resolved and freedom protected. Fosters a sense of fairness by studying the nature, history and functions of law and its application in contracts, property, torts and First Amendment rights. Final exam. Prereq: 2/C standing or department permission. Must be completed prior to a cadet's seventh semester. Sem hrs: 3 fall or spring. Offered only to Class of 1979 and subsequent classes. First offering: Fall 1977.

Law 400. Law for Commanders *1(1)*

A survey of the principles of public and private law which officers encounter in their official and personal capacities, including crimes, evidence, military justice, administrative law, persons, law of air space, laws of war, laws relating to prisoners of war, legality of orders, and personal estate planning. Final exam. Prereq: Law 300 (210) and 1/C standing. Sem hrs: 3 fall or spring.

Law 451. American Constitutional Law *1(1)*

An inquiry into legal problems which arise when constitutionally divided power is allocated to separate elements of government. Special attention is given to the judicial branch as arbiter in determining the limits on national and state power, in protecting the individual against governmental activity which offends the Bill of Rights and other constitutional guarantees, and in securing civil rights. Final exam. Prereq: Law 300 (210); Pol Sci 202 (211). Sem hrs: 3 spring. (For Fall 1978 and subsequent years, course offered only in fall semester.)

Law 461. International Law *1(1)*

The role of public international law in the decision-making processes of sovereign nations. Topics include limitations on national power over the oceans and seabed, the law of airspace, space, and celestial bodies, sovereign immunity, the legal status of members of the armed forces stationed abroad, international protection of human rights, restrictions on methods and means of combat, the use of force by nations, and the role of the United Nations and other

international organizations. Final exam. Prereq: 1/C or 2/C standing. Sem hrs: 3 fall.

Law 462. Government Contract Law 1(1)

Comprehensive study of government contract law with emphasis given to basic legal principles, procurement policy, methods of procurement, types of contracts, contract clauses, taxation, regulation, social and economic provisions, disputes procedures, default remedies and terminations. Final exam. Prereq: Law 300 (210); 1/C or 2/C standing. Sem hrs: 3 spring.

Law 495. Special Topics 1(1)

Selected topics in law. A seminar in the legal implications of contemporary social, economic, and political problems. Examines the ability of the American legal system to solve problem areas such as organized and white collar crime, prison reform, environmental and population control, welfare reform, abortion, rights to privacy, war and morals, and others. Final report. Prereq: 1/C standing and department permission. Limited enrollment. Sem hrs: 3 fall or spring.

Management *(Mgt)*

Offered by the Department of Economics, Geography and Management

Mgt 203. Introduction to Management ½(1)

Introduction to the principles and techniques of management, with major emphasis upon planning, organizing and controlling. Theoretical concepts are introduced with applications to the needs of future Air Force officers. Case studies and experiential problems. Final exam. Prereq: Econ 201 and concurrent enrollment in Econ 202 (for scheduling). Sem hrs: 1½ fall or spring. First offering: Spring 1977.

Mgt 330. Financial Accounting 1(1)

Fundamental accounting concepts and techniques necessary for administration of an organization. Includes analysis of transactions, classification and recording of data, amortization of assets, treatment of taxes, and other elements of an accounting system for the measurement of operating results and financial condition. Final exam. Sem hrs: 3 fall or spring. Offered only to Classes of 1977 and 1978. Last offering: Spring 1977.

Mgt 331. Statistical Decision Methods 1(1)

The inter-relationships between probability concepts and statistical techniques are emphasized through the use of interval estimation and hypothesis testing as an analytical input to the decision-making process. The use of probabilities to aid in making decisions in the face of uncertainty is stressed. Non-parametric methods in research and sample survey methods are discussed. Final exam. Prereq: Math 220 (222). Sem hrs: 3 fall.

Mgt 332. Managerial Accounting 1(1)

Provides basic insights into the managerial implications and applications of accounting data. Topics covered include accounting controls and reports, control of decentralized operations, basic cost accounting, flow of funds analysis, budgeting and use of quantitative techniques to aid decision making. Final exam. Prereq: Mgt 330 or 341. Sem hrs: 3 spring.

Mgt 336. Introduction to Management and Organizations 1(1)

Theories of management and organization are developed and compared with emphasis on different management functions and organizational forms. Specific management functions covered are planning, organizing, directing, communicating, controlling and coordinating. The key features of the bureaucratic form of organization are considered and contrasted with alternative organizational structures. Case studies are employed where appropriate to illustrate and synthesize the major concepts developed in the course. Final exam. Prereq: Beh Sci 302. Sem hrs: 3 fall or spring. Offered only to Classes of 1977 and 1978. Last offering: Fall 1977.

Mgt 339. Introduction to Management Science 1(1)

Management of production systems in areas of business and defense. Major areas of study are the design, operation and control of production/operations management systems. Some of the management techniques discussed are the systems concept, PERT, CPM, and statistical quality control. Final exam. Sem hrs: 3 fall or spring.

Mgt 341. Introduction to Accounting and Organizations 1(1)

Introduction to the processes that influence organizations and managerial decisions. Topics include such organizational issues as groups in organizations, goal setting, and conflict and change in organizations. Also studied are the fundamental accounting concepts and techniques necessary for effective administration of an organization. These include such topics as the analysis of transactions, classification and recording of data, and the amortization of assets. Final exam. Prereq: Mgt 203. Sem hrs: 3 fall. Offered only to Class of 1979 and subsequent classes. First offering: Fall 1977.

Mgt 346. Organization Theory 1(1)

A study of how organizations act and react with respect to their technical and social environments. Organization design and structure, organizational typologies, analyzing organizational performance, environmental constraints, and measuring organizational performance. Contingency theories of organization and management are studied using case studies and current readings. Term project or final exam. Prereq: Mgt 203 or 339. Sem hrs: 3 fall or spring. Offered only to Class of 1979 and subsequent classes. First offering: Fall 1978.

Mgt 360. Decision Analysis *1(1)*

Model building, decision analysis and decision theory with special emphasis on application to defense management decisions. Final exam. Prereq: Math 220 (222). Sem hrs: 3 spring. First offering: Spring 1978.

Mgt 361. Personnel Management and Industrial Relations *1(1)*

Surveys the field of personnel management to include personnel selection, training, and performance appraisal. Includes an introduction to labor relations in the United States with an emphasis on the collective bargaining process. Examines the development of the Federal Civil Service and military personnel systems. Guest speakers and case studies are used to highlight major topic areas. Final exam. Prereq: Mgt 203 or 339. Sem hrs: 3 fall or spring.

Mgt 437. Managerial Finance *1(1)*

Course covers techniques of financial decision making with emphasis on the internal operation of an organization. Basic concepts and tools for financial analysis are stressed. Included in the course is a financial management simulation which requires application of basic tools and concepts. Also included are case studies and military problems which address special problems inherent in non-profit organizations. Final exam. Prereq: Mgt 330 or 341. Sem hrs: 3 fall.

Mgt 460. Management Science *1(1)*

Introduction to Management Science techniques, including linear programming, inventory theory, replacement theory, queueing theory and sensitivity analysis. Emphasis on application of these tools to solve Air Force management problems. Final exam. Prereq: Mgt 331 or Math 357. Sem hrs: 3 fall or spring.

Mgt 462. Advanced Management Science *1(1)*

Study of more advanced Management Science techniques including transportation problems, networks, dynamic programming, integer programming and nonlinear programming. Emphasis on model formulation and Air Force applications. Final exam. Prereq: Mgt 460 or department permission. Sem hrs: 3 spring.

Mgt 470. Seminar in Organization Theory *1(2)*

A seminar on current concepts of how organizations act and react with respect to their technical and social environments. Managerial processes, measuring organizational performance and achievement, aspects of influencing and controlling organization participants, contingency theories of management, and current issues in military management will be studied and discussed using case studies and current readings. Getting people to work together, communicate and execute decisions in the Air Force environment will be the focus of the term project. Term project or final exam. Prereq: 1/C standing. Sem hrs: 3 spring. Last offering: Spring 1978.

Mgt 472. Defense Managerial Applications *1(2)*

Stresses problem identification, strategic planning, decision theory, policy formulation and general management issues through the use of defense related cases and critical incidents. Current developments in management will be reviewed and applied to a variety of defense management problems. Actual involvement with current Air Force problems will be emphasized. Final exam. Prereq: 1/C standing. Sem hrs: 3 spring.

Mgt 475. Distribution Management *1(1)*

A study of the concepts, tools, and techniques of physical distribution management. Markets, life-cycle, product development, procurement, total cost concepts, product and service promotion, and distribution planning are topics discussed. Case studies, guest speakers and computer simulations are used to emphasize topics. A term project is used to emphasize Air Force applications of distribution management techniques such as recruiting, selling to the military, and parts inventory management. Term project. Prereq: Mgt 203 (Econ 212). Sem hrs: 3 fall.

Mgt 482. Investment Analysis *1(1)*

An introduction to investments and investment analysis. Marketable securities such as stocks, bonds, and mutual funds are emphasized. Investments in land, life insurance and other media are surveyed. A computerized stock market game is used to provide experience in investment decision making. Final exam. Prereq: Econ 202 (212). Sem hrs: 3 fall or spring.

Mgt 485. Systems Acquisition and Management *1(1)*

Discussion of management problems inherent in development and acquisition of large, complex systems and the buyer-seller relationships of government agencies and their industrial contractors. Major areas of study include: the requirements process, defense contracting procedures, management and control of large programs and marketing characteristics of the defense industry. Case studies of recent weapon systems programs plus a program management simulation exercise of a new weapon system are used to provide the setting for class discussions. Final exam. Sem hrs: 3 spring.

Mgt 495. Special Topics *1(1)*

Selected topics in management. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Mgt 499. Independent Study *1-2(0)*

Tutorial investigation of a specific area of management. No final. Sem hrs: 2 to 5 fall or spring.

Mathematics *(Math)*

Offered by the Department of Mathematical Sciences

Math 103. Pre-Calculus Mathematics *1(2)*

College algebra and trigonometry. Final exam. Prereq: Department recommendation. Sem hrs: 3 fall.

Math 131. Calculus I *1(2)*

Functions; plane analytic geometry; limits, including limits at infinity and infinite limits; theorems on differentiation; differentiation of algebraic functions; differential calculus. Final exam. Sem hrs: 3 fall or spring.

Math 132. Calculus II *1(2)*

Derivatives and antiderivatives, to include e^x, ln x, trig and inverse trig functions, and logarithmic differentiation; definite integrals; calculus applications to include min/max, area between curves, fluid pressure, center of mass, and moments of inertia. Final exam. Prereq: Math 131. Sem hrs: 3 fall or spring.

Math 133. Calculus III *1(2)*

Integration techniques to include substitution methods, integral tables, integration by parts, and improper integrals. Multiple variable calculus, including vectors, multiple integrals, and partial differentiation; solid analytic geometry to include lines, planes, and surfaces in 3-space. Final exam. Prereq: Math 132. Sem hrs: 3 fall or spring.

Math 134. Differential Equations and Matrices *1(2) or 1(1)*

Differential equations, Taylor polynomials, infinite series; matrices and linear algebraic equations; and numerical methods. Final exam. Prereq: Math 133 (124). Sem hrs: 3 fall or spring.

Math 220. Probability and Statistics *1(1)*

Introduction to descriptive and inferential statistics, including frequency distribution, sampling techniques, discrete and continuous random variables, expected values, statistical estimation, hypothesis testing, regression and correlation analysis using hand calculators in engineering, physical and social science applications. Final exam. Prereq: Math 133 (124). Sem hrs: 3 fall or spring.

Math 330. Applied Vector Analysis *1(1)*

Matrix algebra and systems of linear equations; vector calculus, gradient, divergence, curl; Divergence Theorem; Stokes' Theorem; tensor definitions and notation; complex variable operations, complex analytic functions, conformal mapping. Final exam. Prereq: Math 133 (124). Sem hrs: 3 fall or spring.

Math 341. Introductory Numerical Analysis *1(1)*

Numerical solutions of non-linear equations; numerical methods in linear algebra; theory of polynomial approximations; interpolation theory; error analysis; numerical integration and numerical solution of differential equations; computer programming laboratory exercises. Final exam. Prereq: Math 134 (221); Comp Sci 100 (200). Sem hrs: 3 fall or spring.

Math 342. Numerical Analysis with Applications *1(1)*

Small digital computer programming with computer graphics applications. Applications of Fourier Approximation techniques. Numerical techniques for statistical least-squares approximations. Solution of systems of non-linear equations. Fortran programming exercises and a term project applying methods from one or more of the general topics. Final exam. Prereq: Math 341. Sem hrs: 3 spring.

Math 351. Applied Differential Equations *1(1)*

First order differential equations; second order linear differential equations; numerical techniques; power series solutions; partial differential equations. Final exam. Prereq: Math 134 (221). Sem hrs: 3 fall or spring.

Math 357. Probability with Statistics *1(1)*

Essentials of modern probability and random variables; discrete and continuous random variables and their distributions; characterizations of random variables; derived distributions; sampling distributions; the central limit theorem and the law of large numbers. Successful completion fulfills requirement for Math 220. Final exam. Prereq: A or B in Math 134 (221) or department permission. Sem hrs: 3 fall or spring.

Math 358. Statistics *1(1)*

Common techniques of statistical inference; probability distributions used in statistics; hypothesis testing, emphasizing both Type I and Type II errors, and including experimental design considerations; point and confidence interval estimation; curve fitting and regression analysis. Final exam. Prereq: Math 357. Sem hrs: 3 fall or spring.

Math 360. Linear Algebra *1(1)*

Matrix algebra and systems of linear equations; determinants; vector spaces including function spaces and inner product spaces; linear transformations including rotations, matrix of a linear transformation, change of basis and transition matrices; eigenvalues, eigenvectors, and quadratic forms; computation with and properties of special matrices. Final exam. Prereq: Math 134 (221). Sem hrs: 3 fall or spring.

Math 365. Modern Algebra *1(1)*

Study of algebraic structures and functions between these structures. Topics include: cyclic groups; permutation groups, normal subgroups and quotient groups; quotient rings and ideals; polynomial rings; finite field extensions. Applications to number theory, ge-

ometry, and coding theory. Final exam. Prereq: Math 134 (221). Sem hrs: 3 spring.

Math 366. Advanced Calculus I *1(1)*

Theoretical study of concepts of calculus for functions of one variable. Final exam. Prereq: Math 134 (221). Sem hrs: 3 fall or spring.

Math 367. Advanced Calculus II *1(1)*

Theoretical study of concepts in multivariable calculus. Final exam. Prereq: Math 360; Math 366. Sem hrs: 3 fall.

Math 368. Intermediate Differential Equations *1(1)*

A study of linear and non-linear differential equations from both computational and theoretical point of view. Topics include nth order linear equations, systems of differential equations, series solution techniques, stability theory, and Lyapunov functions. Final exam. Prereq: Math 360; Math 366. Sem hrs: 3 fall or spring.

Math 371. Introduction to Operations Research *1(1)*

An introductory course in the mathematical techniques of operations research emphasizing applications. Topics include linear programming, dynamic programming, game theory, queueing theory, inventory models, Markov chains, network techniques, search techniques, and simulation. Final exam. Prereq: Math 220 (222) or Math 357. Sem hrs: 3 fall.

Math 376. Introduction to Point-Set Topology *1(1)*

Sets, functions, limit points, closure, subspaces, continuity, connectedness, compactness, metric spaces; applications to the real line and Euclidean n-space. Final exam. Prereq: Math 366 or department permission. Sem hrs: 3 spring.

Math 441. Linear Programming *1(1)*

Review of matrix algebra, convex sets and linear inequalities. Model formulation and applications. Theory and implementation of the simplex, the revised simplex, and the transportation algorithms. Duality theory and sensitivity analysis. Introduction to integer programming, models and algorithms. Final exam. Prereq: Math 360. Sem hrs: 3 fall.

Math 442. Decision Theory and Game Theory *1(1)*

Fundamentals and applications of decision theory to include Bayesian statistics, subjective probability and utility theory. Introduction to game theory. Final exam. Prereq: Math 220 (222) or Math 357. Sem hrs: 3 spring.

Math 451. Complex Variables *1(1)*

Analytic functions; mapping, integrals; power series; residues and poles; applications. Final exam. Prereq: Math 134 (221). Sem hrs: 3 spring.

Math 455. Advanced Engineering Mathematics *1(1)*

Applied partial differential equations; solutions of boundary value problems. Methods of solution include eigenfunction expansion, Green's functions, and variation of parameters. Final exam. Prereq: Math 351 or Math 368. Sem hrs: 3 fall or spring.

Math 495. Special Topics *1(1)*

Selected advanced topics in mathematics. Fall 1976 and Spring 1977 offerings to be announced. Final exam. Prereq: Department permission. Sem hrs: 3 fall or spring.

Math 499. Independent Study and Research *1(0)*

Individual study and/or research under the direction of a faculty member. Oral midterm and final; term paper. Prereq: Department permission. Sem hrs: 1 to 6 fall or spring.

Mechanics *(Mech)*

Offered by the Department of Civil Engineering, Engineering Mechanics and Materials

Mech 110. Introductory Engineering Mechanics *1(1)*

The fundamentals of engineering analysis and application of physical laws to the solution of basic problems encountered in the engineering sciences. Final exam or final design project. Prereq: Completed or enrolled in Math 132 (122). Sem hrs: 3 fall or spring.

Mech 120. Engineering Fundamentals *1(2)*

Introduction to the basic principles of engineering. Includes fundamentals of problem analysis and application of physical laws to the solution of basic problems encountered in the engineering sciences. Creative problems of introductory design and analysis included in the spring semester. Final exam. Prereq: Completed or enrolled in Math 132 (122). Sem hrs: 3 fall. Last offering: Fall 1976.

Mech 210. Engineering Materials *1(1)*

Engineering materials and their application in the design of practical systems. Emphasis on materials properties, mechanical behavior and failure mechanisms, including corrosion, fatigue, and fracture effects. Influence of composition and processing on material properties. Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall or spring. First offering: Spring 1977.

Mech 320. Dynamics *1(1)*

Equilibrium in three dimensions. Kinematics including absolute and relative motion. Kinetics including force-mass-acceleration, work-energy, and impulse-momentum. Free and forced linear vibrations of a single

degree of freedom system. Vector methods of solution are emphasized where applicable. Final exam. Prereq: Mech 110 (120); Math 134 (221). Sem hrs: 3 fall or spring. First offering: Fall 1977.

Mech 331. Aircraft Structures *1(1)*

A study of techniques commonly used to determine loads and their effect on aircraft structural components. Includes effect of bending, torsion and shear on typical semimonocoque structures, using both classical and energy methods. Various special topics such as fasteners, fracture mechanics and aircraft structural repair are introduced. Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall. First offering: Fall 1977.

Mech 332. Intermediate Structural Mechanics *1(1)*

Principles of structural mechanics are established through the application of strain displacement, constitutive and equilibrium relations to various idealized structural elements. Topics include the elastic and inelastic analysis of axially or torsionally loaded bars and beams, failure theories, and column buckling. Final exam. Prereq: Mech 331 or Civ Engr 372 (451). Sem hrs: 3 spring. First offering: Spring 1979.

Mech 350. Experimental Stress Analysis *1(2)*

Introduction to techniques of experimental stress analysis. Includes the theory and application of strain gages, photo-elasticity, and holography. Approximately one-third of the class periods are spent in the lab gaining experience in the use of the latest lab equipment. Included is a special project for which each cadet, or group of cadets, designs, builds, and tests some type of transducer. No final exam. Prereq: Mech 362. Sem hrs: 3 fall. Last offering: Fall 1976.

Mech 352. Mechanical Properties of Materials *1(1)*

Behavior of materials under simple and combined stress systems. Elementary crystal structure and dislocation theory; phases, phase diagrams, strengthening mechanisms and alloy systems. Principles of plastic deformation; brittle fracture; fatigue; failure theories. Fundamentals of fracture mechanics and behavior of composite materials; analysis of materials and design influences. Final exam. Prereq: Mech 210 (355). Sem hrs: 3 spring. First offering: Spring 1979.

Mech 355. Materials Science I *1(1)*

Analysis of engineering materials and their application in the design of aerospace systems. Fundamentals of crystalline arrangements and imperfections, nonmetallic materials and composites; phase relationships in one and multicomponent systems, diffusion, strengthening mechanisms, corrosion and environmental effects; commercial developments for structures, propulsion and re-entry. Final exam. Prereq: Mech 362. Sem hrs: 3 fall or spring. Last offering: Spring 1978.

Mech 356. Materials Science II *1(2)*

A study of the physical metallurgy and properties of materials. Basic principles of diffusion processes, solidification, and phase diagrams; transformations of phases, thermal-mechanical treatment of commercial alloys and the effects of microstructure. Lab. Final exam. Prereq: Mech 355. Sem hrs: 3 spring. Last offering: Spring 1977.

Mech 361. Vector Engineering Mechanics *1(2)*

Statics including resultants, equilibrium, and friction. Kinematics including absolute and relative motion. Kinetics including force-mass-acceleration, work-energy, and impulse-momentum. Vector methods of solution are emphasized where applicable. Lab. Final exam. Prereq: Mech 110 (120); Math 124 (134) or department permission. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Mech 362. Mechanics of Materials *1(2)*

The stresses and deflections developed in materials as a result of centric, torsional, flexural, and combined loadings; including statically indeterminate structural members and columns. Includes an introduction to the basic mechanical properties of materials with discussions of strengthening mechanisms, fracture, creep, fatigue, and corrosion. Lab. Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall or spring. Last offering: Fall 1977.

Mech 373. Introduction to Aerospace Structures *1(1)*

Loads, torsion, unsymmetrical bending, bending shear, energy techniques, and combined loading applied to aerospace structures. General stress analysis and an introduction to some practical aspects such as aircraft structural repair. Final exam. Prereq: Mech 362. Sem hrs: 3 fall. Last offering: Fall 1976.

Mech 395. Automotive Systems Analysis *1(2)*

An analysis of system engineering with special emphasis on the application of engineering principles to automotive components and their integration into a complete system. The purpose is to provide a better appreciation of the application of theoretical analysis in the creation, design, maintenance, trouble-shooting and repair of complicated engineering systems. Topics covered include vehicle dynamics, suspension system, power plant, drive train, electrical-mechanical system, steering and braking systems, types of tires, design, selection of materials, safety devices, and the integration of these into a workable unit. Final report. Prereq: 1/C or 2/C standing; Mech 320 (361). (Course enrollment will be limited; cadets desiring to take this course must contact the department for approval prior to registration.) Sem hrs: 3 fall or spring.

Mech 420. Vibrations *1(1)*

Free and forced vibrations of single and multidegree of freedom systems. Includes linear and non-linear

systems, treats multidegree systems by matrix methods and introduces vibrations of continuous media. Final exam. Prereq: Math 351 and Mech 320 (361). Sem hrs: 3 fall or spring. First offering: Fall 1977.

Mech 424. Advanced Strength of Materials 1(1)

Analysis of stress and strain with emphasis on the relationship between stress, strain and deformation in structural elements. Includes the theories of failure, bending of unsymmetrical cross sections, torsion of shafts of arbitrary cross section and thin-walled closed and open sections. Final exam. Prereq: Mech 362. Sem hrs: 3 fall. Last offering: Fall 1976.

Mech 432. Advanced Structural Mechanics 1(1)

Energy methods of structural analysis including the principles of virtual work and minimum potential energy as applied to the analysis of trusses and frames. The finite element approach is introduced. Stiffness matrices for elements are obtained using both equilibrium and energy approaches. Problem solving procedures are illustrated using the computer and FORTRAN language. Final exam. Prereq: Mech 332 (362). Sem hrs: 3 spring. First offering: Spring 1978.

Mech 451. Physical Metallurgy 1(2)

A study of the physical metallurgy and properties of materials. Basic principles covered include materials structure and imperfections, diffusion, thermodynamics, phases and phase transformations, the iron-carbon system, steels and alloys, and thermomechanical processing. Special topics include ceramics, polymers and corrosion. Lab. Final exam. Prereq: Mech 352 (355). Sem hrs: 3 fall. First offering: Fall 1977.

Mech 453. Aerospace Structures 1(1)

Energy methods of structural analysis; principle of stationary potential energy applied to the analysis of trusses and frames. Energy methods for the determination of structural element stiffness characteristics. Matrix structural analysis using the direct stiffness approach for the solution of structures composed of many elements. Final exam. Prereq: Mech 362. Sem hrs: 3 fall. Last offering: Fall 1976.

Mech 454. Intermediate Dynamics 1(1)

Study of three-dimensional kinematics, dynamics of particles and systems of particles. Lagrangian dynamics and dynamics of rigid bodies. Final exam. Prereq: Mech 320 (361); Math 351. Sem hrs: 3 fall.

Mech 456. Mechanical Metallurgy 1(1)

Behavior of materials under simple and combined stress systems. Elementary dislocation theory, principles of plastic deformation, strengthening mechanisms, brittle fracture, fatigue, failure theories. Fundamentals of fracture mechanics and behavior of composite materials; analysis of materials failure and design influences. Final exam. Prereq: Mech 355 or department permission. Sem hrs: 3 fall. Last offering: Fall 1978.

Mech 459. Advanced Aerospace Materials 1(1)

Advanced and theoretical topics in the development of high temperature materials for aerospace systems. An examination of the fundamental principles of metallurgical thermodynamics. Analysis of ideal and non-ideal liquid and solid alloys, heterogeneous equilibria, phase diagrams, gas-metal reactions and corrosion principles; oxidation-resistant and high-temperature materials. Problems in materials application at high temperature. Final exam. Prereq: Mech 352 (355). Sem hrs: 3 spring.

Mech 461. Experimental Mechanics 1(1)

Introduction to experimental techniques. Includes the theory and application of dynamic instrumentation, photography, strain gages, photo-elasticity, holography and non-destructive inspection. Approximately one-half of the class periods are spent in the lab gaining experience in the use of the latest equipment. Included is a special project for which each cadet, or group of cadets, designs, builds, calibrates, and tests a transducer. No final exam. Prereq: Mech 320 (361) and Mech 331 (373). Sem hrs: 3 fall. First offering: Fall 1977.

Mech 462. Engineering Design 1(2)

Application of engineering principles to the creative design process. Special emphasis is placed on the analysis, design and construction of prototype models. Topics include the creative design process, basic manufacturing techniques, technical communications, measurement systems and project management methods. Major design project and a final report. Prereq: Mech 320 (361); Mech 451 (356) or Mech 461 (350). Sem hrs: 3 spring. First offering: Spring: 1978.

Mech 464. Engineering Design 1(2)

Application and integration of engineering principles in the creative design processes. Includes analysis and design of systems, study of design process, basic manufacturing techniques, background engineering topics, qualitative and quantitative engineering design activity, and component and systems engineering design. Final report. Prereq: Mech 361 and Mech 355. Sem hrs: 4 fall or spring. Last offering: Spring 1977.

Mech 472. Intermediate Vibrations 1(1)

Free and forced linear vibrations of single and multi degree-of-freedom systems. Exact and approximate analyses of linear vibrations of continuous bodies. Final exam. Prereq: Math 351; Mech 361 or Physics 355. Sem hrs: 3 spring. Last offering: Spring 1977.

Mech 480. Advanced Topics in Mechanics or Materials Engineering 1-2(1)

Selected topics in engineering mechanics or materials engineering. Fall 1976 and Spring 1977 offering.

Materials in Engineering Design. Final exam. Prereq: Department permission. Sem hrs: 3 fall or spring.

Mech 482. Advanced Aerospace Structures *1(1)*

A continuation of Aerospace Structures with emphasis on the finite element method. Includes derivation of element stiffness for beam, two-dimensional plane and plate bending elements using assumed displacement functions. Computer solution to continuous beam, large scale plane and plate bending problems. Final exam. Prereq: Mech 432 (453). Sem hrs: 3 spring.

Mech 495. Special Topics *1(2)*

Selected topics in mechanics. Fall 1976 and Spring 1977 offering: Studies in Applied Mechanics. Final exam or final report. Prereq: Department permission. Sem hrs and offering time determined by department (not more than 3 sem hrs).

Mech 499. Independent Study *0-2(0)*

Individual study, research, or design on a topic established with the permission of the department head. Final report. Sem hrs: 1 to 5 fall or spring.

Military Studies *(Mil Stu)*

Offered by the Deputy Commandant for Military Instruction

Mil Stu 121. The Military as a Profession *0(1)*

A study of the basic mission, organization and operation of the USAF. It introduces the cadet to the military ethic and profession and provides knowledge of the USAF's present posture. Establishes a background essential to later military and academic studies. No final exam. Prereq: 4/C standing. Sem hrs: 1½ fall.

Mil Stu 122. Leadership in a Military Environment *0(1)*

A study of the current international role of the USAF in conjunction with an increased emphasis on leadership and the role of the USAF in society. Leads to a social awareness by the cadet in preparing for future responsibilities as an officer in the USAF. No final exam. Prereq: 4/C standing. Sem hrs: 1½ spring.

Mil Stu 221. Basic Leadership Communication Skills *0(2)*

Development of communicative skills through the study and application of the principles and techniques of communications as they apply to the Air Force officer. No final exam. Prereq: 3/C standing. Sem hrs: 1½ fall.

Mil Stu 222. Advanced Leadership Communications Skills *0(2)*

Further development and application of communicative skills and techniques, with increased emphasis on cadet preparation for assuming instructional and leadership roles at the Air Force Academy and as officers in the USAF. No final exam. Prereq: 3/C standing. Sem hrs: 1½ spring.

Mil Stu 321. Operational Leadership *0(2)*

Introduction to the foundation of military leadership through an examination of command and staff authority and responsibility. Includes a study of the role of the staff officer to prepare the student for increased cadet responsibility. Introduction to the characteristics of air power and USAF doctrine. Includes development of the communicative skills learned in Mil Stu 221/222. No final exam. Prereq: 2/C standing. Sem hrs: 1½ fall.

Mil Stu 322. U. S. Air Force Operations Today *0(2)*

Investigations of present USAF operational capabilities, the study of strategic and tactical air power. Includes both nuclear and conventional employment planning exercises and seminars on current USAF challenges. No final exam. Prereq: 2/C standing. Sem hrs: 1½ spring.

Mil Stu 420. Officer Transition *0(2)*

Preparation for the transition from cadet to officer status. Instruction provides the cadet with personal and practical aspects of life and work in the Air Force, with particular emphasis on career planning and the rights, privileges and responsibilities of a second lieutenant entering his initial assignment. Offered the last half of spring semester. Pass/Fail. No final. Prereq: 1/C standing. Sem hrs: ½ spring.

Military Training *(Mil Tng)*

Offered by the Commandant of Cadets

Mil Tng 100. Basic Cadet Training *0(0)*

Approximately six-week transition period from civilian to military life. Indoctrination in the overall Academy program, cadet regulations, the Honor Code, manual of arms, drill, customs and courtesies and other general military subjects. Introduction to basic Air Force weapons, firing course (rifle and pistol), field encampment, parasailing and orientation flights in operational Air Force aircraft. Pass/Fail. No final. Prereq: Concurrent enrollment in Phy Ed 100. Sem hrs: 5 summer.

Mil Tng 200. Third Class Summer Training *0(0)*

Three weeks of training in any of the following courses: Mil Tng 201, Mil Tng 452, Mil Tng 495, Armnshp 451, Armnshp 461, Armnshp 471, Armnshp 481, Armnshp 490. All options are pass/fail. No

final. Sem hrs: 2 summer. Credit and duration of Mil Tng 495 may vary.

Mil Tng 201. Operation Noncom Program 0(0)

Conducted at selected Air Force bases. The program provides an insight into and appreciation of the role of enlisted personnel in the accomplishment of the Air Force mission. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 210. Survival, Evasion, Resistance, and Escape Training SERE 0(0)

Three-week Basic Aircrew Survival Training program of approximately two weeks on-base training covering global aspects of survival and code of conduct, and approximately one week of field training. Completion satisfies USAF Survival Training requirements. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2½ summer.

Mil Tng 300. Second Class Summer Training 0(0)

Six weeks of training in any two of the following three-week courses: Mil Tng 301, Mil Tng 302, Mil Tng 303, Mil Tng 304, Mil Tng 305, Mil Tng 306, Mil Tng 307, Mil Tng 309, Mil Tng 310, Mil Tng 452, Mil Tng 495, Armnshp 433, Armnshp 461, Armnshp 471, Armnshp 481, Armnshp 490, Armnshp 493, Av 460, Av 493, and Av 494. All courses are pass/fail. No final, except Av 460, Av 493, and Av 494 which are graded. Sem hrs: 4 summer (2 hours per three-week course). Av 460, Av 493, and Av 494 are 3 sem hr courses. Credit and duration of Mil Tng 495 may vary.

Mil Tng 301. Operation Third Lieutenant Program 0(0)

Conducted at selected Air Force bases. Provides exposure to an operational Air Force unit and functions of a junior officer. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 302. BCT Leadership Duty 0(0)

Leadership positions as instructors or noncommissioned officers (NCOs) in the cadet chain of command in the Basic Cadet Training program for the new Fourth Class. Pass/Fail. No final. (Administered by the Deputy Commandant for the Cadet Wing and the Deputy Commandant for Military Instruction). Sem hrs: 2 summer.

Mil Tng 303. RECONDO Training 0(0)

Field tactical training conducted by the U.S. Army at Fort Carson and North Cheyenne Canyon. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 304. Underwater Demolition and Open Circuit Scuba Training 0(0)

Diving training program conducted by the U.S. Navy at San Diego. Satisfactory completion results in being certified world-wide scuba qualified. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 305. Boys State 0(0)

Positions as counselors for high school juniors at various American Legion Boys State encampments. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 306. BSA Philmont 0(0)

Positions at Philmont Scout Ranch in Cimarron, New Mexico, as rangers or instructors in the staff camp areas. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 307. Composite Group Leadership Duty 0(0)

Cadet NCO leadership positions maintaining command, control, and accountability and providing billeting for all cadets taking summer academic courses and transient cadets using cadet area facilities. Pass/Fail. No final. (Administered by the Deputy Commandant for the Cadet Wing.) Sem hrs: 2 summer.

Mil Tng 309. Academy Awareness Program 0(0)

Selected cadets serve as counselors and tutors for minority group students in the San Diego school district. (Administered by the Minority Affairs Division under the office of Admissions and Registrar.) Sem hrs: 2 summer.

Mil Tng 310. SERE Leadership Duty 0(0)

Leadership positions as instructors and as NCOs in the cadet chain of command for the Third Class SERE Training Program. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 330. Summer Leadership Preparation 0(0)

Instruction and training for selected Third Class and Second Class cadets to prepare them for Second Class/First Class summer leadership or instructor positions. Pass/Fail. No final. Prereq: Pre-selection for key summer leadership or instructor position. (Administered by the Deputy Commandant for the Cadet Wing and the Deputy Commandant for Military Instruction.) Sem hrs: 1 spring.

Mil Tng 400. Summer Leadership Preparation *0(0)*

Six weeks of training in either one six-week course, two three-week courses, or special course from the following listings:

a. Three-week courses: Mil Tng 401, Mil Tng 402, Mil Tng 403, Mil Tng 404, Mil Tng 405, Mil Tng 406, Mil Tng 407, Mil Tng 408, Mil Tng 409, Mil Tng 410, Mil Tng 452, Armnshp 410 and 411 (440/441, as applicable), Armnshp 433, Armnshp 461, Armnshp 471, Armnshp 481, Armnshp 490, Armnshp 493, Av 460, Av 493, and Av 494. All three-week courses are Pass/Fail. No final except Armnshp 441, Av 460, Av 493, and Av 494, which are graded. Sem hrs: 2 summer (3 hrs for Armnshp 441, Av 460, Av 493 and Av 494; 5 hrs for Armnship 410/411).

b. Six-week courses: Mil Tng 411, Science 499. Mil Tng 411 and Science 499 require final reports and are Pass/Fail. Sem hrs: 4 summer.

c. Special Programs: French 492, Mil Tng 495. French 492 is a graded course with separate registration and separate scheduling. Final exam. Sem hrs: 8 summer. Mil Tng 495 sem hrs, leadership credit, and duration may vary depending on the nature of the program.

Mil Tng 401. Operation Third Lieutenant Program *0(0)*

Conducted at selected Air Force bases. Provides exposure to an operational Air Force unit and functions of a junior officer. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 402. BCT Leadership Duty *0(0)*

Leadership positions as instructors or as officers in the cadet chain of command in the Basic Cadet Training program for the new Fourth Class. Pass/Fail. No final. (Administered by the Deputy Commandant for the Cadet Wing and the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 403. RECONDO Training *0(0)*

Field tactical training by the U.S. Army at Fort Carson in North Cheyenne Canyon. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 404. Underwater Demolition and Open Circuit Scuba Training *0(0)*

Diving training program conducted by the U.S. Navy at San Diego. Satisfactory completion results in being certified world-wide scuba qualified. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

Mil Tng 405. Boys State *0(0)*

Positions as counselors for high school juniors at various American Legion Boys State encampments. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 406. BSA Philmont *0(0)*

Positions at Philmont Scout Ranch in Cimarron, New Mexico, as rangers or instructors in the staff camp areas. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 2 summer.

Mil Tng 407. Composite Group Leadership Duty *0(0)*

Cadet officer leadership positions maintaining command, control, and accountability and providing billeting for all cadets taking summer academic courses and transient cadets using cadet area facilities. Pass/Fail. No final. (Administered by the Deputy Commandant for the Cadet Wing.) Sem hrs: 2 summer.

Mil Tng 408. Manpower Unlimited *0(0)*

Positions at the Academy as counselors for underprivileged children. Pass/Fail. No final. (Administered by the Director of Plans and Programs under the Deputy Chief of Staff Operations.) Sem hrs: 2 summer.

Mil Tng 409. Academy Awareness Program *0(0)*

Selected cadets serve as counselors and tutors for minority group students in the San Diego school district. (Administered by the Minority Affairs Division under the Office of Admissions and Registrar.) Sem hrs: 2 summer.

Mil Tng 410. SERE Leadership Duty *0(0)*

Leadership positions as instructors and as officers in the cadet chain of command for the Third Class SERE Training program. Pass/Fail. No final. (Administered by the Military Training Division under the Deputy Commandant for Miiltary Instruction.) Sem hrs: 2 summer.

Mil Tng 411. Air Training Command Leadership Duty *0(0)*

Leadership positions with a Basic Military Training Squadron at Lackland AFB, Texas, as assistants to squadron commanders and as basic airmen training instructors and counselors. Pass/Fail. No final. (Administered by the Director of Cadet Operations and Plans.) Sem hrs: 4 summer.

Mil Tng 452. Basic Airborne Training *0(0)*

Conducted at the U.S. Army Infantry School, Fort Benning, Georgia. Includes basic skills of static line parachute jumping. Pass/Fail. No final. (Administered by the Military Training Division under

the Deputy Commandant for Military Instruction.) Sem hrs: 2 summer.

MilTng 495. Special Training Programs 0(0)
Special training, participation, observing, leadership, and/or instructing programs conducted to fill a temporary or unforeseen need or to test a new program or concept prior to full implementation. Pass/Fail. No final. (Administered by the Deputy Commandant for Military Instruction.) Sem hrs, leadership credit, and duration may vary depending on the nature of the program (not to exceed 7½ sem hrs).

Navigation *(Nav)*

Offered by the Deputy Commandant for Military Instruction. See Aviation listing for other Aviation Science courses. See Science 371 and Science 480 for other Astronomy courses.

Nav 471. Advanced Applied Navigation 1(2)
Navigation procedures, fuel planning, and radio, radar, and celestial navigation are integrated into the cadet's knowledge from the basic aviation course. Flying is accomplished in the T-43 and T-37 aircraft. Emphasizes the navigation proficiency required of a candidate in the early phases of Undergraduate Navigator Training. Prereq: Av 470 or Av 460; 1/C standing (cadets desiring to take this course must contact the Aviation Science Division for approval prior to registration). Sem hrs: 3 fall or spring.

Philosophy *(Philos)*

Offered by the Department of Political Science and Philosophy

Philos 210. Introduction to Philosophy 0(1)
Brief examinations of several classical and contemporary philosophical issues. Issues include problems in human knowledge, moral philosophy, social philosophy, and the philosophy of religion. Final exam. Prereq: 2/C or 3/C standing; concurrent enrollment in Law 210 (for scheduling purposes). Must be completed prior to the sixth semester. Sem hrs: 1 fall or spring. Last offering: Spring 1977.

Philos 310. Ethics 1(1)
Critical study of major ethical themes such as responsibility, freedom, obligation, duty, and human rights. These themes are approached by reading major Western philosophers. Themes are related to typical moral issues including those arising in the context of war. Course also incorporates brief introduction to the study of philosophy. Final exam. Prereq: 1/C, 2/C, or 3/C standing or department permission. Sem hrs: 3 fall or spring. First offering: Fall 1977.

Philos 330. Introduction to the Philosophy of Science 1(1)
Basic assumptions and principles of the sciences are analyzed. Emphasizes the nature of the scientific method, the status of scientific laws, concepts of theory construction and scientific explanation, the use of probability notions, problems involved in the social sciences, and the relation between the sciences and the humanities, especially in the formation of values. Specific problems are discussed related to technology, the natural sciences, and the social sciences. Final exam. Prereq: 1/C or 2/C standing or department permission. Sem hrs: 3 fall.

Philos 350. Theory of Knowledge and Metaphysics 1(1)
Classical and contemporary techniques of conceptual analysis as reflected in the traditional problems of epistemology and metaphysics. Final exam. Prereq: 1/C, 2/C or 3/C standing. Sem hrs: 3 fall.

Philos 370. Introduction to Symbolic Logic 1(1)
Propositional calculus, formal languages, truth tables, and proofs. Predicate calculus, models, Gentzen-type rules, axioms, quantifiers, and equality. Definitions. Final exam. Prereq: Completed or enrolled in Comp Sci 200. Sem hrs: 3 spring.

Philos 382. American Philosophy 1(1)
An examination of the philosophic background of Puritanism, the Revolutionary period, transcendentalism and pragmatism with special reference to the thought of major American philosophers such as Pierce, James, Royce, Santayana, Dewey, and Whitehead. Final exam. Prereq: Completed or enrolled in Philos 210 or Philos 310. Sem hrs: 3 spring.

Philos 400. Great Religions of the World 1(1)
A comparative and critical study of the world's great religions which emphasizes the relation of religion to morality; the nature of religious aspirations; the spiritual influence of religion upon culture and society; the sacred scriptures; the concept of God, salvation, evil, and the afterlife. Includes a survey of religious thought and practice through a study of Christianity, Buddhism, Judaism, Hinduism, Confucianism, and Islam. Final exam. Prereq: 1/C, 2/C, or 3/C standing. Sem hrs: 3 fall or spring.

Philos 440. Ethics 1(1)
Critical study of major ethical themes such as responsibility, freedom, obligation, duty, human rights, and human dignity. Background to these themes are developed by reading major Western philosophers. Themes are related to typical moral issues such as those arising in the context of war. Final exam. Prereq: Philos 210 or 1/C or 2/C standing. Sem hrs: 3 fall or spring. Last offering: Spring 1978.

Philos 495. Special Topics *1(1)*
Selected topics in philosophy. Fall 1976 offering: "Science, Creativity and Self-Realization," Spring 1977 offering: "The Military Mind." Final exam or final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

Philos 499. Independent Study *1(0)*
Philosophical research guided by an instructor. Topics and meetings arranged with the instructor. No final. Prereq: Department permission. Sem hrs: 3 fall or spring.

Physical Education *(Phy Ed)*

Offered by the Department of Physical Education under the Director of Athletics

Phy Ed 100. Basic Physical Training *0(0)*
Preparation for strenuous physical education and athletics by development of physical strength, endurance, agility, and coordination by means of conditioning exercises, obstacle course, and sports competition. Physical fitness and swimming tests. Special instruction in swimming and conditioning as needed. Pass/Fail. Sem hrs: 2 summer.

Phy Ed 105. Competitive Athletics *0(0)*
Intramural and/or intercollegiate athletics. Pass/Fail. Sem hrs: 1 fall.

Phy Ed 106. Competitive Athletics/ Physical Fitness Test *0(0)*
Intramural and/or intercollegiate athletics plus passing cadet minimums on Physical Fitness Test. Pass/Fail. Sem hrs: 1 spring.

Phy Ed 120. Gymnastics, Boxing (Men Only), Fencing (Women Only), Swimming, Physical Fitness Methods *0(2)*
Instruction in gymnastics, boxing (men), fencing (women), swimming and physical fitness methods. Remedial instruction in swimming for designated cadets. Sem hrs: 1 fall and spring.

Phy Ed 205-206. Competitive Athletics/ Physical Fitness Test *0(0)*
Intramural and/or intercollegiate athletics plus passing cadet minimums on Physical Fitness Test. Pass/Fail. Sem hrs: Phy Ed 205 — 1 fall; Phy Ed 206 — 1 spring.

Phy Ed 220. Lifesaving, Wrestling (Men Only), Track and Field (Women Only) and Two Carry-Over Skills *0(2)*
Instruction in lifesaving, wrestling (men), track and field (women), and two carry-over skills (tennis, golf, volleyball or handball (men) and badminton (women)). Sem hrs: 1 fall and spring.

Phy Ed 305-306. Competitive Athletics/ Physical Fitness Test *0(0)*
Intramural and/or intercollegiate athletics plus passing cadet minimums on the Physical Fitness Test. Pass/Fail. Sem hrs: Phy Ed 305 — 1 fall; Phy Ed 306 — 1 spring.

Phy Ed 320. Judo, Survival Swimming, and two Carry-Over Skills *0(2)*
Instruction in judo, survival swimming, and two carry-over skills (tennis, golf, volleyball or handball (men) and badminton (women)). Carry-over skills received in Phy Ed 220 will not be repeated. Sem hrs: 1 fall and spring.

Phy Ed 405-406. Competitive Athletics/ Aerobics Test *0(0)*
Intramural and/or intercollegiate athletics and must pass Aerobics Fitness Test. Pass/Fail. Sem hrs: Phy Ed 405 — 1 fall; Phy Ed 406 — 1 spring.

Phy Ed 420. Unarmed Combat, Squash, and two Electives *0(2)*
Instruction in unarmed combat, squash and two electives (either advanced golf, advanced tennis, basic ice skating, diving, basketball, racquetball or aerobics). Remedial instruction in swimming for designated cadets. Prereq: Phy Ed 200 or Phy Ed 320 as pertains to carry-over skills. Sem hrs: 1 fall and spring.

Phy Ed 440. Physiology of Exercise *1(1)*
Selected classroom and laboratory studies of the human organism in motion. An examination of the physiological factors affecting human performance under various degrees of stress and environmental conditions. Emphasis is placed on control mechanisms, characteristics of muscular contraction, energy sources and other body adjustment mechanisms in response to physical exercise. Final exam. Prereq: Department permission. Sem hrs: 3 fall.

Phy Ed 450. Tests and Measurements *1(1)*
The purpose and use of tests and measurements in the field of physical education are discussed in relation to their application in Air Force programs. The fundamental principles underlying test construction are analyzed. Basic statistical concepts are explored as they apply to understanding program objectives and student achievement. Final exam. Prereq: Department permission. Sem hrs: 3 spring.

Phy Ed 460. Scientific Principles and Methods of Coaching *1(1)*
The study of scientific principles of coaching from selected team and individual sports. The fundamental factors underlying athletic performance are analyzed in relation to the laws of physics. Emphasis is placed upon the philosophy and methods of human motivation in athletics from various perspectives: biological,

physiological, psychological and sociological. Final exam. Prereq: Department permission. Sem hrs: 3 spring.

Physics *(Physics)*

Offered by the Department of Physics

Physics 211. General Physics I *1(1)*

Review of mechanics emphasizing work and energy. Introduction to fluid mechanics and thermodynamics. Emphasis is placed on the conservation laws and the use of vectors and calculus. Applications selected from topics in atmospheric physics. Lab. Final exam. Prereq: Mech 110 (120). Sem hrs: 3 fall or spring.

Physics 212. General Physics *1(1)*

Fundamental principles of electricity, magnetism, and wave motion with emphasis on conservation laws and use of vectors and calculus. Includes introduction to selected topics in optics and modern physics. Lab. Final exam. Prereq: Physics 211; Math 123 or department permission. Sem hrs: 3 fall. Last offering: Fall 1976.

Physics 311. General Physics II *1(1)*

Fundamental principles of electricity and magnetism, wave motion, and optics. Emphasis is placed on the conservation laws and the use of vectors and calculus. Lab. Final exam. Prereq: Physics 211. Sem hrs: 3 fall or spring. First offering: Spring 1977.

Physics 335. Modern Physics for Engineers *1(1)*

Introduction to modern physics with emphasis on applications to the various fields of engineering and science. Fundamental topics of modern physics to include special relativity, origin of quantum theory, atomic and molecular structure, electromagnetic radiation, nuclear forces and reactions, fundamental particles, radioactivity and special topics of current interest to engineering and science majors. Final exam. Prereq: Physics 212. Sem hrs: 3 fall or spring.

Physics 357. Classical Mechanics I *1(1)*

Particle kinematics and dynamics, conservation laws, gravitation, oscillations, and an introduction to Lagrangian dynamics. Final exam. Prereq: Physics 211; completed or enrolled in Math 351. Sem hrs: 3 fall.

Physics 358. Classical Mechanics II *1(1)*

Lagrangian and Hamiltonian dynamics, central force motion, two-particle collisions, special relativity, rotating coordinates, rigid bodies, coupled oscillations, waves, and an introduction to quantum mechanics. Final exam. Prereq: Physics 357. Sem hrs: 3 spring.

Physics 363. Introduction to Modern Physics I *1(1)*

Introduction to special relativity. Consideration of the dual nature of light and of the wave nature of particles. Investigation of the Bohr model of the atom. Introduction to quantum mechanics and its application to solution of problems involving simple forms of potential energy. Application of the Schroedinger equation to the hydrogen atom. Final exam. Prereq: Physics 212; completed or enrolled in Math 351. Sem hrs: 3 fall.

Physics 364. Introduction to Modern Physics II *1(1)*

Continuation of Physics 363. Quantum mechanical approach to angular momentum as applied to hydrogen atom. Atomic and molecular spectra. Investigation of various models of the nucleus. Nuclear reactions and decay schemes; fission and fusion. Particle detectors and accelerators. Brief introduction to solid state physics. Discussion of elementary particle theory. Final exam. Prereq: Physics 363 in preceding semester. Sem hrs: 3 spring.

Physics 370. Introduction to Space Science *1(1)*

A conceptual survey of the space environment including such topics as planetary atmospheres, solar phenomena, trapped-radiation belts, radio astronomy, extraterrestrial life and space exploration. Field trip. Final exam. Prereq: Physics 212. Sem hrs: 3 fall or spring.

Physics 382. Laser Physics and Light *1(1)*

Theory of laser operation. Optical phenomena including interference, polarization, coherence, and absorption. Solid-state, liquid, chemical, and gaseous lasers. Various applications including weapons, communications, and holography. Final exam. Prereq: A or B in Physics 212. Sem hrs: 3 spring.

Physics 411. Modern Physics *1(1)*

Review of the inter-relationships among science and engineering core courses with emphasis on the unifying role of physics and the conservation laws. Introduction to selected topics in modern physics including the concepts and development of physics since 1890. Topics include special relativity, quantum mechanics, radioactivity, and nuclear physics. Final exam. Prereq: Physics 311, Aero 311, El Eng 310, Mech 210. Sem hrs: 3 fall or spring. First offering: Fall 1977.

Physics 430. Introduction to Modern Physics *1(1)*

Application of modern physics with emphasis in the field of civil engineering, including health physics considerations, radiological shielding considerations, nuclear reactors and nuclear weapons effects. Fundamental topics of modern physics including electromagnetic radiation, models of the atom, mass-energy equivalence, and topics in radiation. Final exam.

Prereq: Physics 212. (Not open to students with credit for Physics 335 or Physics 364.) Sem hrs: 3 fall or spring.

Physics 441. Laboratory Techniques *1(2)*

Basic introduction to laboratory skills and techniques to develop instrumental techniques and reinforce concepts of physical behavior. No final. Prereq: Physics 212. Sem hrs: 3 fall.

Physics 442. Advanced Physics Lab. *1(2)*

Selected experiments to develop laboratory skills and reinforce the concepts of physics ideas. No final. Prereq: Physics 441 or department permission. Sem hrs: 3 spring. First offering: Spring 1978.

Physics 459. Quantum Mechanics *1(1)*

Postulation basis of quantum mechanics. Techniques of solution of the wave equation, operators, angular momentum, harmonic oscillator, and hydrogen atom. Quantum theory applied to physical problems. Final exam. Prereq: Physics 358 and Physics 364. Sem hrs: 3 fall.

Physics 461. Electromagnetic Theory I *1(1)*

Development of the basic principles underlying electromagnetic waves including electrostatic fields in both vacuum and in dielectrics, the Laplace and Poisson equations, magnetic fields associated with contant and time varying currents, and magnetic materials. Maxwell's equations are developed. Final exam. Prereq: Physics 212; Math 330 or Physics 358. Sem hrs: 3 fall.

Physics 462. Electromagnetic Theory II *1(1)*

Applications of Maxwell's equations: plane waves, reflection, refraction, guided waves, electric and magnetic dipoles and quadrupoles, and antennas. The interaction between plane waves and plasmas is treated. Final exam. Prereq: Physics 461 in the preceding semester. Sem hrs: 3 spring.

Physics 465. Statistical Physics *1(1)*

Quantum statistical mechanics as an underlying theory of systems in contact. Applications include low temperature physics, magnetism, boson and fermion gases, ideal gases, kinetic theory and thermodynamics. Final exam. Prereq: Physics 364 or department permission. Sem hrs: 3 spring.

Physics 495. Special Topics *1(1)*

Selected topics in physics. Final exam or final report. Prereq: Department permission. Sem hrs: 3. Offering time determined by department.

Physics 496. Science and the Future *1(1)*

An anlysis of the relationship of science to current and future problems. Critically examines the potential applications of modern science to these problems and the general effect of possible solutions on the armed forces, industry and society. Field trip. Final report. Prereq: 1/C and 2/C standing. Sem hrs: 3 spring.

Physics 499. Independent Study *1(0)*

Individual research under the direction of a faculty member. Final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

Political Science *(Pol Sci)*

Offered by the Department of Political Science and Philosophy

Pol Sci 201. Introduction to American and International Politics *½(1)*

Introduction to the basic principles of political science. Emphasizes the concepts used in the study of politics and that context of ideas which is especially applicable to American national government. Begins the study of the political behavior of Americans. Final exam. Sem hrs: 1½ fall or spring. First offering: Spring 1977.

Pol Sci 202. American National Government *½(1)*

Continues study of the political behavior of Americans; then moves to the institutions of American national government. Concludes with a brief examination of some policy outputs in American government. Final exam. Prereq: Pol Sci 201. Sem hrs: 1½ fall or spring. First offering: Spring 1977.

Pol Sci 203. The International Political System *½(1)*

This segment of the introductory sequence is devoted to the study of the relations between nations, with emphasis on the structure and characteristics of the contemporary international political system. Final exam. Prereq: Pol Sci 202. Sem hrs: 1½ fall or spring. First offering: Fall 1977.

Pol Sci 211. The American Political System *1(1)*

First of a two-course sequence introducing central concepts of political science. Develops the theories of democracy, constitutionalism, and federalism in the context of American domestic politics. Emphasizes the functional aspects of the national system of government and concludes with an analysis of contemporary issues and problems. Final exam. Pol Sci 211 and Pol Sci 212 must be taken in consecutive semesters. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Pol Sci 212. The International Political System *1(1)*

Second of a two-course sequence introducing central concepts of political science. International politics as a subject of study. Emphasis on the nature of the in-

ternational political system, the actions and interactions of states in this system, and contemporary trends in international politics. Final exam. Prereq: Pol Sci 211 in preceding semester. Sem hrs: 3 fall or spring. Last offering: Spring 1977.

Pol Sci 232. Comparative Politics *1(1)*

An introduction to the models, concepts and analytical frameworks used to compare political systems. Emphasis is on the functional approach to politics and political change. Final exam. Prereq: Pol Sci 202 (211). Sem hrs: 3 spring.

Pol Sci 349. Political Analysis *1(1)*

Introduction to the philosophical and methodological foundations of contemporary political science. Emphasis on current research methods in domestic and international politics: interview/survey research, content analysis, simulation and experimentation, and systematic case studies. Research paper. Prereq: Pol Sci 202 (211). Sem hrs: 3 fall.

Pol Sci 352. Political Theory *1(1)*

An overview of political thought from Machiavelli to the present with a brief introductory section on classical political theory. The consideration of basic political problems such as equality, power, and estrangement in terms of how political theorists dealt with them in the past and how these problems relate to the present. Research paper. Prereq: Pol Sci 202 (211). Sem hrs: 3 spring.

Pol Sci 371. Political Parties and the Democratic Process *1(1)*

An in-depth view of the dynamics of American politics within the party system. Emphases on party functions, components, types, ideologies, membership, organization, leadership selection, financing and discipline. Last portion of the course devoted to issues of campaigning and reform. Final exam. Prereq: Pol Sci 202 (211). Sem hrs: 3 fall.

Pol Sci 383. American Foreign Policy: Process and Issues *1(1)*

Analysis of U.S. foreign policy in the post-1945 period. Examination of the policy-making environment and the roles of the President, the Department of State, the Congress, and various executive departments. Case studies. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 fall.

Pol Sci 385. Public Administration and U.S. Public Policy *1(1)*

Analyzes the formulation and execution of public policy in America as a bureaucratic phenomenon. Includes study of organization theory, administrative process, structure of U.S. federal administrative establishment, decision-making theory, bureaucratic politics, and policy process and policy analysis. Concludes with a study of the administration of actual public programs and a concentration on issues of public management. Research paper. Prereq: Pol Sci 202 (211). Sem hrs: 3 spring.

Pol Sci 412. Defense Policy *1(1)*

Relationships among military policy, foreign policy, and national security policy. Formulation of defense policy in terms of external threats, American political climate, and impact of military technology. Institutional machinery for making strategy. Final exam. Prereq: Pol Sci 203 (212) or department permission. Sem hrs: 3 fall or spring.

Pol Sci 421. Political Violence and Revolutionary Change *1(1)*

Focuses on the use of organized violence by nongovernmental groups designed to achieve political objectives of various kinds, the social conditions underlying such actions, the factors which account for the success or failure of these efforts, and the resulting effects on the larger socio-political context. Particular emphasis is placed on insurgency warfare. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 fall.

Pol Sci 456. International Organization *1(1)*

Examines how the structure and functions of global international organizations (principally the United Nations) and regional international organizations (such as the North Atlantic Treaty Organization) are used by national governments to further foreign policy objectives as well as transnational human interests. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 fall.

Pol Sci 460. Comparative Defense Policy *1(1)*

A comparative study of selected defense policies and policy making with emphasis on the Soviet Union, China, selected Western European states, Japan and India. Case studies examine varations in doctrine, weapons acquisition, and force deployment and use. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 spring.

Pol Sci 472. Politics of the USSR *1(1)*

Studies the communist system of government emphasizing both the internal political processes and external relations of the USSR. The effects of ideology, national interest, internal forces and foreign relations are analyzed. In the examination of foreign policy, emphasis is placed on the post-1945 era. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 fall.

Pol Sci 473. Politics of Asia *1(1)*

Surveys government and politics of selected countries in East Asia with emphasis on China and Japan. Course includes examination of China's expanding power and influence, implications of a resurgent Japan and other current Asian issues. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 fall.

Pol Sci 474. Politics of Western Europe 1(1)
Political developments in Western Europe from the Marshall Plan to the present. Examines institutional arrangements and political strategies of major Western European nations. Considers potential of a united Europe as a third force. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 spring.

Pol Sci 476. Politics of Latin America 1(1)
Comparative study of selected Latin American political systems. Fundamental factors affecting political stability in Latin America; the inter-relationship of economic, military, political, and social factors in the growth of Latin American political systems; and the inter-hemisphere relations. Final exam. Prereq: Pol Sci 203 (212). Sem hrs: 3 spring.

Pol Sci 478. Politics of Africa and the Middle East 1(1)
Analysis of the major political trends within Africa and the Middle East during the 20th Century. The colonial epoch, independence era, contemporary political systems, and major issues in conflict are surveyed. Research paper. Prereq: Pol Sci 203 (212). Sem hrs: 3 spring.

Pol Sci 482. Congress 1(1)
The study of Congress as a political institution. Topics include elections, member relations with constituents, policy roles, leadership, the committee system, seniority, procedures, and oversight of administrative agencies. Field trip to Denver to view the Colorado State legislature (if in session) is required. Final exam. Prereq: Pol Sci 202 (211). Sem hrs: 3 fall.

Pol Sci 484. The Presidency 1(1)
An in-depth study of the American Presidency, with emphasis on the office of the Presidency, Presidential selection, roles of the President, and the personalities and working styles of the modern presidents. Final exam. Prereq: Pol Sci 202 (211). Sem hrs: 3 spring.

Pol Sci 495. Special Topics 1(1)
Selected topics in political science. Fall 1976 offering: "Elections 1976." Spring 1977 offering: "The Development of Strategy and Arms Control." Final exam or final report. Prereq: Department permission. Sem hrs: 3 fall or spring.

Pol Sci 499. Independent Study 1-2(0)
Individual study or research in a carefully selected topic conducted on a tutorial basis. Research paper or directed reading. Prereq: Department permission. Sem hrs: 3 fall or spring.

Science *(Science)*

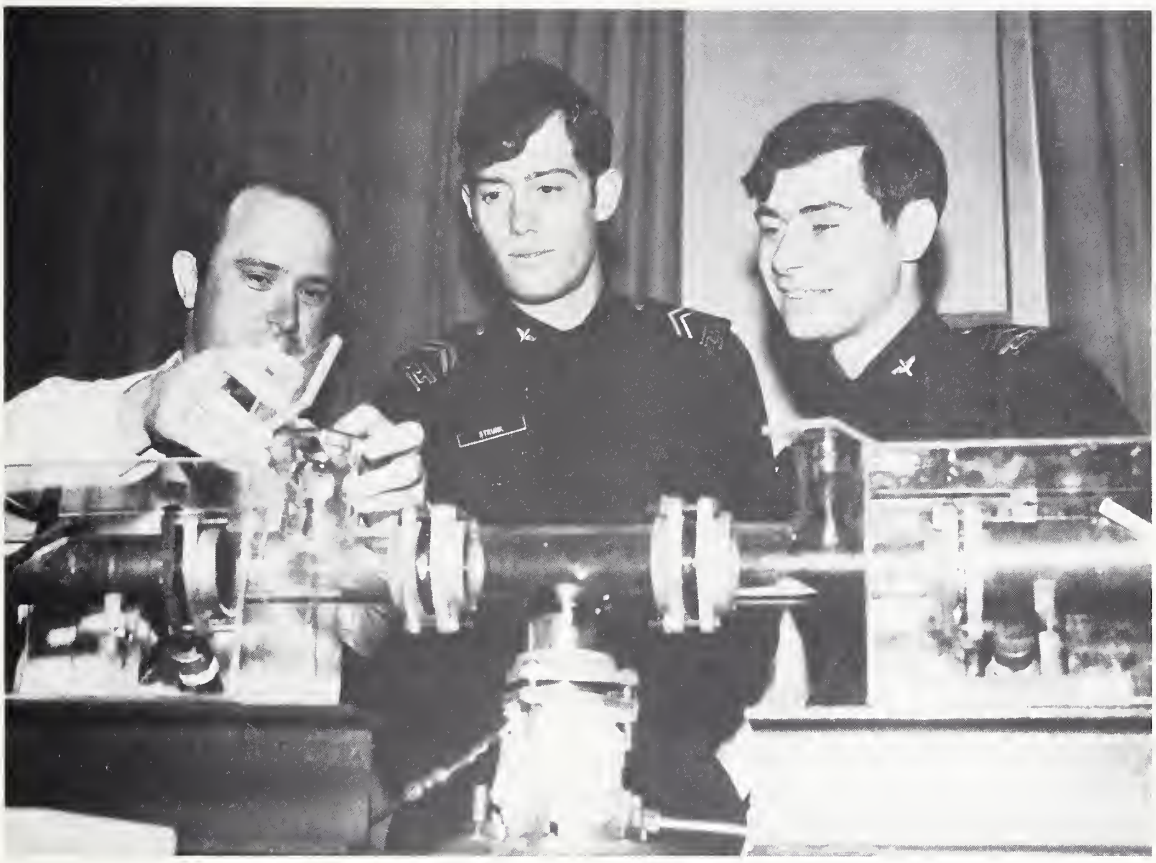
Offered by various departments and divisions as noted

Science 371. Descriptive Astronomy 1(1)
Discussion of fundamental concepts of astronomy. Examination of the physical aspects of the solar system: the sun, moon, planets, comets, and meteors. Introduction to the physical nature and distribution of the stars. Discussion of the structure and origin of the universe. Planetarium presentations and telescope observations of celestial objects. Flight mission to experience and analyze the motions of the heavens in an inflight environment. Final report. (*Administered by Aviation Sciences Division.*) Sem hrs: 3 fall or spring.

Science 452. Bioengineering 1(1)
Application of engineering techniques to solution of problems in the life sciences. Review of selected life science systems, mathematical model making, and design of instrumentation for physiological monitoring. Final report. Prereq: El Engr 332 or El Engr 310 or El Engr 340 or El Engr 341. (*Administered by the Department of Chemistry and Biological Sciences in fall, Department of Electrical Engineering in spring.*) Sem hrs: 3 fall or spring.

Science 480. Introduction to Applied Astronomy 1(1)
Spherical astronomy topics of positions, motions, stellar coordinate systems, time, and navigation. Stellar astronomy topics of distances, motions, luminosities, masses, distribution of stars, clusters, galaxies, and cosmology. Planetarium, telescope, and inflight laboratory experience in conjunction with a visit to a prominent astronomy or space facility. Final project. Prereq: 1/C or 2/C standing or department permission. (*Administered by the Aviation Sciences Division.*) Sem hrs: 3 fall or spring.

Science 499. Summer Research 0(0)
Observation and participation in advanced research projects with military and civilian agencies working on defense-oriented problems at locations throughout the United States. Final report. Not graded: performance report rendered by research sponsor. (*Administered by the Director of Faculty Research.*) Sem hrs: 4 summer. Fulfills requirement for Mil Tng 400, Summer Leadership Preparation.



ACADEMIC MAJORS

Some of the majors specify open options and/or academic divisional options in identifying graduation requirements. These are defined as follows:

An Open Option: Any graded course under supervision of the Dean of the Faculty for which at least two semester hours credit is awarded. Open options also include Armnship 440, Aviation 470, Aviation 490, Nav 471, and all Science courses under supervision of the Commandant of Cadets; Phy Ed 440, Phy Ed 450, and Phy Ed 460 under supervision of the Director of Athletics.

An Academic Divisional Option: Any course unit from the offerings of the Basic Sciences, Engineering Sciences, Social Sciences or Humanities Divisions.

Aeronautical Engineering Major

Administered by the Department of Aeronautics

The Aeronautical Engineering major is a sequence of courses in which cadets may emphasize aircraft flight mechanics, propulsion, aerodynamics or structures. Successful completion results in the degree of Bachelor of Science in Aeronautical Engineering.

In addition to the core curriculum, the following courses are required for the major:

Aero 356. Flight Mechanics I
Aero 371. Aerodynamics I
Aero 372. Aerodynamics and Design
Aero 450. Aeronautical Laboratory
Aero 461. Propulsion I
Aero 471. Aerodynamics II
Math 351. Applied Differential Equations

Two course units of either Aircraft Design (Aero 464) or Propulsion Design (Aero 466)

Two course units selected from offerings of the Engineering or Basic Science Divisions

Astronautical Engineering Major

Administered by the Department of Astronautics and Computer Science

The Astronautical Engineering major is the broad application of science and engineering to aerospace operations. Special emphasis is placed on astrodynamics, aerospace systems design, and control systems including weapon delivery systems. Thus, the student is prepared for Air Force duty with specialization in research, design, development and analysis of space technology and aerospace avionics. Cadets who successfully complete this major are awarded the degree of Bachelor of Science in Astronautical Engineering.

In addition to the core curriculum, the following courses are required for the major:

Aero 356. Flight Mechanics I
Astro 450. Principles of Airborne Fire Control
Astro 451. Astrodynamics
Astro 452. Linear Control System Analysis
Astro 453. Advanced Astrodynamics
Astro 454. Inertial Navigation and Automatic Guidance
Math 351. Applied Differential Equations
Mech 320. Vector Engineering Mechanics
Engr 350. Linear Systems Analysis

A two course unit design sequence in control systems or space vehicles

Atmospheric Science Minor

Administered by the Department of Physics

The minor in Atmospheric Science is for the student interested in the environment in which the Air Force operates. It provides a background especially valuable to any rated officer and a foundation for possible future graduate study in Atmospheric Science. By completing the following five courses, cadets can earn a minor in Atmospheric Science in conjunction with a major in Basic Sciences or a major in Physics:

Atm Sci 250. Introduction to Atmospheric Science
Atm Sci 351. Physical Processes in the Atmosphere
Atm Sci 380. Weather Forecasting Techniques
Atm Sci 445. Atmospheric Dynamics
{ Atm Sci 495. Special Topics
or
Physics 370. Introductory Space Science

Aviation Sciences Major

Administered by the Departments of Astronautics and Computer Science, Aeronautics, and Physics

The Aviation Sciences major provides a broad program of study with nearly equal emphasis in the various disciplinary areas. It prepares the cadet for widely varied Air Force duties and graduate educational opportunities without special orientation to any single academic discipline at the undergraduate level.

In addition to the core curriculum, nine majors courses are required, consisting of one course from each of the nine categories below, with not more than two courses overall from any single discipline in the first eight categories.

The Military Profession

Beh Sci 464. Organizational Behavior Practicum
Beh Sci 490. Counseling
Beh Sci 390. The Military in Evolving Society
Mgt 361. Personnel Management and Industrial Relations
Engl 370. Speech
Pol Sci 495. Civil-Military Relations
Philos 495. The Military Mind
Hist 494. The American Way of War

Heritage and Values

Hist 479. American Institutions and Ideas
Hist 371 Air Power and Modern Warfare
Law 451. American Constitutional Law
Philos 400. Great Religions of the World
Hist 382. History of Science and Technology

National Security Issues

Econ 477. Defense Economics
Econ 374. Survey of International Economic Issues
Pol Sci 421. Political Violence and Revolutionary Change
Pol Sci 383. American Foreign Policy: Process and Issues.
Pol Sci 460. Comparative Defense Policy
Hist 363. Unconventional Warfare

Management

Econ 477.	Defense Economics
Law 462.	Government Contract Law
Mgt 339.	Introduction to Management Science
Mgt 472.	Managerial Policy
Mgt 485.	Systems Acquisition and Management

Analytical Methods

Mech 320.	Vector Engineering Mechanics
Math 371.	Introduction to Operations Research
Math 357/358.	Probability and Statistics (Math 357 taken as a core-substitute for Math 220)
Math 351.	Applied Differential Equations
Mgt 331.	Statistical Decision Methods
Chem 222.	Analytical Chemistry

Environment

Atm Sci 250.	Introduction to Atmospheric Science
Physics 370.	Introductory Space Science
Geog 340.	Cartography
Sci 371.	Descriptive Astronomy
Chem 381.	Chemistry of the Environment
Bio Sci 280.	Fundamentals of Ecology

Systems

Astro 395.	Aerospace Flight Simulation
Engr 350.	Linear Systems Analysis (Corequisite Mech 320)
Av 490.	Navigation Concepts and Systems Development
El Engr 480.	Studies in Military Electronics
Comp Sci 362.	Computer Simulation (Prerequisite Math 357 or Math 220 with department permission)

Aviation Technology

Aero 356.	Flight Mechanics I
Aero 434.	Aircraft and Engine Performance Laboratory
Aero 461.	Propulsion I (Prerequisite Aero 361)
Aero 371.	Aerodynamics I
Civ Engr 481.	Air Base Engineering
Av 470.	Applied Aviation and Navigation Theory

Airmanship/Navigation

Armnshp 440.	Pilot Indoctrination Program
Nav 471.	Advanced Applied Navigation

Basic Sciences Major

Administered by the Basic Sciences Division

The major in Basic Sciences is designed for the student with an interest in the broad scope of science. It allows the cadet to sample a range of scientific areas with a limited degree of specialization in the area of greatest interest. Departmental options must be chosen from offerings of the Departments of Chemistry and Biological Sciences, Mathematics and Physics. The science options are courses selected from the Basic and Engineering Science field, including a total of 12 disciplines.

In addition to the core curriculum, the following courses are required for the major:

Two course units from the offerings of one of the departments listed in the Basic Sciences Division

Two course units from the offerings of a second of the three departments in the Basic Sciences Division

One course unit from the offerings of the third department in the Basic Sciences Division

Two course units from the offerings of the Basic or Engineering Sciences Division

One academic divisional option; one open option

Behavioral Sciences Major

Administered by the Department of Behavioral Sciences and Leadership

The major in Behavioral Sciences provides the cadet with the facility for understanding human behavior, the capability for handling human problems throughout his career as an Air Force officer, and the basis for his continuing development as a military leader. The major is divided into three areas of emphasis: Individual Behavior, Organizational Behavior and Human Factors Engineering. The factual knowledge and concepts developed are contemporary in scope and of particular importance to the education of all officers in operational command positions and those contemplating a career in behavioral science research, human factors engineering, personnel psychology, social actions, clinical psychology, and organizational behavior.

In addition to the core curriculum, the following courses are required for the major:

Beh Sci 331.	Statistical Tests and Measurements
Beh Sci 352.	Social Psychology
Beh Sci 435.	Learning
Beh Sci 351.	Cultural Anthropology
or	
Beh Sci 360.	Sociology

Individual Behavior

Beh Sci 350. Psychobiology
Beh Sci 380. Personality Theory
Beh Sci 372. Experimental Psychology
Beh Sci 470. Human Factors and Perceptual Processes
Beh Sci 490. Counseling
or

Organizational Behavior

Beh Sci 464. Organizational Behavior-Practicum
Beh Sci 477. Organizational and Industrial Psychology
Beh Sci 490. Counseling
Mgt 346. Organizational Theory·
Mgt 361. Personnel Management and Industrial Relations
or

Human Factors Engineering

Beh Sci 372. Experimental Psychology
Beh Sci 470. Human Factors and Perceptual Processes
Astro 395. Aerospace Flight Simulation
Civ Engr 481. Air Base Engineering
Studies in Military Electronics
One academic divisional option; one open option

Biological Sciences Major

Administered by the Department of Chemistry and Biological Sciences

The major in Biological Sciences is intended for the student whose abilities and talents lie in any area of biological science. It prepares cadets for a junior officer position in aerospace research and development and provides the undergraduate prerequisites for the advanced training required for admission into related career fields. The use of laboratory methods is emphasized for reinforcement of lecture material and for individual research projects. The major is a suggested preparatory sequence for future advanced training in all fields of life and biological sciences.

In addition to the core curriculum, the following courses are required for the major:

Bio Sci 330. Introduction to Biological Sciences
Bio Sci 331. Plant and Animal Taxonomy
Bio Sci 363. Genetics
Bio Sci 380. Bioenvironmental Science
Bio Sci 383. Human Anatomy
Bio Sci 447. Physiology
Two course units from the offerings of the Department of Chemistry and Biological Sciences
Two academic divisional options; one open option

Chemistry Major

Administered by the Department of Chemistry and Biological Sciences

The major in Chemistry is recommended for those who are interested in chemical or biochemical research or applications. It provides fundamental knowledge in analytical, inorganic, organic and physical chemistry and allows the cadet to select one or two of these areas for advanced study. The major is designed to prepare cadets for a junior officer position in research, development, or graduate training. It emphasizes the use of laboratory methods for reinforcement of lecture material and individual research projects. Cadets successfully completing this major are awarded the degree of Bachelor of Science in Chemistry.

In addition to the core curriculum, the following courses are required for the major:

Chem 222. Analytical Chemistry (only required for those who do not take Chem 101-102 or Chem 121-122)
Chem 233-234. Organic Chemistry I and II
Chem 243-244. Organic Chemistry I and II Lab
Chem 335-336. Physical Chemistry I and II
Chem 345-346. Physical Chemistry I and II Lab
One of the following courses:
Chem 431. Theoretical Inorganic Chemistry
or
Chem 434. Biochemistry
Chem 453. Instrumental Chemistry
One science course unit selected with approval of the faculty advisor

This major fulfills the recommendations of the Committee on Professional Training of the American Chemical Society. Cadets in this major should take German or Russian to satisfy the core language requirement.

Civil Engineering Major

Administered by the Department of Civil Engineering, Engineering Mechanics and Materials

The major in Civil Engineering provides a well balanced program stressing the fundamentals common to the many areas of the civil engineering profession. The major is designed to prepare cadets for duty in the Air Force with some specialization in the civil

engineering discipline including research, development, design, and construction of facilities to support manned and unmanned weapon systems and the space program. The major provides excellent preparation for graduate study in any of the civil engineering areas. Cadets successfully completing this major are awarded the degree of Bachelor of Science in Civil Engineering.

In addition to the core curriculum, the following courses are required for the major:

Civ Engr 361. Fundamental Hydraulics
Civ Engr 381. Engineering Measurements and Construction
Civ Engr 372. Behavior and Analysis of Structures
Civ Engr 392. Soil Mechanics
Civ Engr 471. Behavior and Design of Concrete Members
Civ Engr 472. Behavior and Design of Steel Members
Math 351. Applied Differential Equations
Mech 332. Intermediate Structural Mechanics
Mech 320. Dynamics

One civil engineering related course selected from an approved list

One course from the offerings of the Basic Sciences or Engineering Sciences Divisions

Computer Science Major

Administered by the Department of Astronautics and Computer Science

The major in Computer Science provides a broad background in computer programming, languages, systems and applications with emphasis on electronic digital computers. The aim of this major is to provide officers who are highly qualified in the rapidly growing areas of computer research and the application of computers to complex scientific, engineering and information systems.

In addition to the core curriculum, with Math 357 as a substitute for Math 220, the following courses are required for the major:

Comp Sci 362. Computer Simulation
Comp Sci 380. Data Structures
Comp Sci 381. Computers and Programming
Comp Sci 483. Operating Systems
Comp Sci 485. Computer Architecture
Comp Sci 463. Information Retrieval
or
Comp Sci 484. Programming Systems
Mgt 460. Operations Analysis I
Math 341. Introductory Numerical Analysis
Math 358. Statistics
Engr 451. Engineering Applications of Digital Computers

One computer science related course unit selected with approval of faculty advisor.

Economics Major

Administered by the Department of Economics, Geography and Management

The major in Economics is designed to provide the cadet with the capability of performing economic analysis, especially to resource allocation problems associated with national security. The major is constructed on a solid foundation of economic theory and is extended by training in quantitative analysis techniques and by study in alternative specialized fields of economics.

In addition to the core curriculum, the following courses are required for the major:

Econ 333. Price Theory
Econ 350. International Economics
Econ 456. Macroeconomic Theory
Econ 465. Introduction to Econometrics
Econ 477. Defense Economics
Mgt 331. Statistical Decision Methods

Four course units approved by the major advisor in two of the following areas of concentration: International Economics, Domestic Policy, or Quantitative Methods

One open option

Electrical Engineering Major

Administered by the Department of Electrical Engineering

The major in Electrical Engineering provides an opportunity to pursue a tightly integrated, yet well-rounded, course of study covering the major areas of electrical technology as well as related and supporting disciplines. The program emphasizes the relation between the subjects being taught and their application to and impact on military technological systems. Cadets who successfully complete the requirements of this major are awarded the degree of Bachelor of Science in Electrical Engineering.

In addition to the core curriculum, with El Engr 340 as a substitute for El Engr 310, the following courses are required for the major:

El Engr 341. Electronics I
El Engr 342. Electronics II
El Engr 443. Electromagnetics I
El Engr 464. Design
Math 330. Applied Engineering Mathematics
or
Math 351. Applied Differential Equations

Three one semester hour laboratory courses:
El Engr 351. Laboratory Techniques
El Engr 352. Electronics Laboratory
El Engr 465. Design Laboratory

Four courses in one of two sequences, the Communications Sequence or the Computer Sequence

COMMUNICATIONS SEQUENCE

El Engr 360. Instrumentation Systems
El Engr 444. Electromagnetics II
El Engr 446. Continuous Signals and Systems
El Engr 447. Communications Systems

COMPUTER SEQUENCE

El Engr 380. Modern Logic Design
El Engr 445. Discrete Signals and Systems
El Engr 487. Real-Time Computation
El Engr 488. Microprocessor Systems

One course from the offerings of the Basic or Engineering Sciences Divisions selected with approval of the faculty advisor

Engineering Major

Administered by the Engineering Sciences Division

The major in Engineering is designed for the student whose ability and interests lie in the area of the engineering sciences, but who has not selected an area of specialization in one of the engineering disciplines or who has an interest in an area of engineering that requires a broad engineering background. This major provides a broad education in the engineering sciences as preparation for effective performance in the technical specialties and for future graduate study in engineering. Cadets who successfully complete this major are awarded the degree of Bachelor of Science.

In addition to the core curriculum, the following courses are required for the major:

Aero 356. Flight Mechanics I
El Engr 360. Instrumentation Systems
Mech 320. Dynamics
Engr 350. Linear Systems Analysis

Three courses from the offerings of the Engineering Sciences Division or the Department of Mathematical Sciences

One academic divisional option; one open option

Engineering Mechanics Major

Administered by the Department of Civil Engineering, Engineering Mechanics and Materials

The major in Engineering Mechanics is designed to provide engineers with a broad base of knowledge in fundamental engineering with depth in the areas of dynamics, stress analysis, or materials engineering. The major provides an excellent foundation for further education in a variety of fields. Cadets who successfully complete this major are awarded the degree of Bachelor of Science in Engineering Mechanics.

In addition to the core curriculum, the following courses are required for the major:

Aero 356. Flight Mechanics I
Math 351. Applied Differential Equations
Mech 320. Dynamics
Mech 331. Aircraft Structures
Mech 332. Intermediate Structural Mechanics
Mech 352. Mechanical Properties of Materials
Mech 461. Experimental Mechanics
Mech 462. Engineering Design

Two courses from an approved list of mechanics courses

One course from the offerings of the Basic Sciences or Engineering Sciences Divisions

Engineering Sciences Major

Administered by the Department of Civil Engineering, Engineering Mechanics and Materials

The major in Engineering Sciences is designed to provide a broad education in the engineering sciences as preparation for effective performance in an engineering specialty and for future graduate study in engineering. Cadets who successfully complete this major are awarded the degree of Bachelor of Science in Engineering Sciences.

In addition to the core curriculum, the following courses are required for the major:

Aero 356. Flight Mechanics I
Aero 371. Aerodynamics I
Engr 350. Linear Systems Analysis
Astro 452. Linear Control Systems Analysis
El Engr 360. Instrumentation Systems
Math 351. Applied Differential Equations
Mech 320. Dynamics
Mech 331. Aircraft Structures
A two course unit design sequence in one of the following areas: Airlift Vehicles, Propulsion, Control Systems, Space Vehicles, Systems Design, Computer Design, Electronics, Structures, Experimental Mechanics, Materials
One course from the offerings of the Basic Sciences or Engineering Sciences Divisions

Geography Major

Administered by the Department of Economics, Geography and Management

The major in Geography provides an understanding of the complex geographic relationships in the world today. This major requires a foundation in both cultural and physical geography. Based on this foundation, a cadet may concentrate in depth in physical, cultural or regional geography. The geography major is of particular value to those cadets contemplating Air Force careers in operations planning, foreign area analysis, intelligence, or cartography.

In addition to the core curriculum, the following courses are required for the major:

Geog 242. Analytical Techniques in Geography
Geog 350. Cultural Geography
or
Geog 370. Political Geography
or
Geog 372. Economic Geography
Geog 352. Climatology
or
Geog 353. Physical Geography
Geog 471. Western Europe and the Mediterranean
or
Geog 472. USSR and Eastern Europe
or
Geog 475. Geography of the Developing World/ East Asia and Latin America
Geog 340. Cartography
or
Geog 382. Geographic Application of Imagery Analysis
Geog 491. Seminar in the Basis of Geographic Thought and Research
Two additional course units in geography
Two additional course units from either geography or offerings related to cadet's area of concentration with approval of faculty advisor

History Major

Administered by the Department of History

The major in History provides an understanding of contemporary problems by studying those forces in the past which have shaped the world of the present. The factual knowledge imparted and the perspective developed are of importance to the education of all professional Air Force officers and are of particular value for those cadets contemplating careers in operations, plans, or intelligence activities. The major emphasizes the development of historical judgment, research techniques, and writing skills.

In addition to the core curriculum, the following courses are required for the major:

History 330. Historical Methods
One U.S. History option
One European History option
One Military History/Area History option
One open option
Six course units approved by the advisor in one of the following: Military History; General History; American Studies; Area Studies with a concentration in Europe, the Far East, Latin America, the Middle East, Russia or Africa

Humanities Major

Administered by the Humanities Division

The major in Humanities is offered for those cadets who wish to increase their knowledge in the humanistic areas of language, history, literature, philosophy, and the fine arts.

In addition to the core curriculum, the major requires the following courses:

One course unit in English from the Department of English and Fine Arts
One course unit in history from the Department of History
One course unit in fine arts from the Department of English and Fine Arts
One course unit in philosophy from the Department of Political Science and Philosophy
One course unit in a foreign language from the Department of Foreign Languages
Three academic divisional options; one open option

International Affairs Major

Administered by the Department of Political Science and Philosophy

The major in International Affairs is designed to develop Air Force officers with a comprehensive understanding of contemporary political problems and issues. Courses in the major form the basis for Air Force duties across a broad range of fields allowing the officer to be a generalist while also pursuing assignments requiring skills in research and analysis. Particularly suited to this major are careers in operations and command duties, plans, attache duty, military assistance, military-political affairs, as well as staff and command positions with the Air Force, Unified Commands, Joint Staff, and Department of Defense.

In addition to the core curriculum, the following courses are required for the major:

Pol Sci 232. Comparative Politics
Pol Sci 349. Political Analysis
Pol Sci 352. Political Theory

Five course units approved by the advisor in one of the following areas of concentration: International Politics; Western European, Asian, Latin American, Soviet, Middle Eastern or African Studies; National Security Policy; or American Politics

Two academic divisional options; one open option

Management Major

Administered by the Department of Economics, Geography and Management

The major in Management provides the cadet with the tools, techniques, and attitudes that will assist him in making significant contributions as a junior officer. A principal objective is to accelerate the student's ability to act in a mature and meaningful fashion under conditions of responsibility. The decision-making process is the principal environment toward which most of the material is directed.

In addition to the core curriculum, the following courses are required for the major:

Mgt 341. Introduction to Accounting and Organizations
Mgt 346. Organization Theory
Mgt 332. Managerial Accounting
Mgt 331. Statistical Decision Methods
Mgt 460. Management Science
Mgt 472. Defense Managerial Applications
Econ 465. Introduction to Econometrics
Econ 477. Defense Economics

Two course units related to management selected with approval of the faculty advisor

One open option

Mathematics Major

Administered by the Department of Mathematical Sciences

The major in Mathematical Sciences is designed to provide a thorough background in the techniques of analyzing and solving the complex operational, management and mathematical problems of today's modern Air Force. Sequences in operations research, applied mathematics and analysis provide depth of education in these basic areas. Mathematical applications are stressed through elective courses in other disciplines. The program provides excellent preparation and flexibility of choice for entering AFIT graduate degree programs in engineering, operations research, the physical sciences and mathematics.

In addition to the core curriculum, the following courses are required (Math 357 may be substituted for Math 220 in the core):

Math 341. Introductory Numerical Analysis
Math 357. Probability with Statistics
Math 360. Linear Algebra
Math 366. Advanced Calculus I
Math 368. Intermediate Differential Equations
Math 371. Introduction to Operations Research

One of three four-course-unit sequences in either Operations Research, Mathematical Analysis, or Applied Mathematics

One open option (two if Math 357 substitutes for Math 220)

Physics Major

Administered by the Department of Physics

The major in Physics concentrates on basic physical principles and mathematics. It provides an excellent academic background for a wide range of technical assignments within the Air Force, particularly in the field of research and development. It also provides a

sound basis for graduate work in physics, related applied sciences, and a wide variety of engineering science disciplines.

In addition to the core curriculum, with Physics 363 as a substitute for Physics 411, the following courses are required for the major:

Math 351. Applied Differential Equations
Math Option. Course units offered by the Department of Mathematical Sciences
Physics 357. Classical Mechanics I
Physics 358. Classical Mechanics II
Physics 364. Introduction to Modern Physics II
Physics 441. Laboratory Techniques
Physics 442. Advanced Physics Lab
Physics 459. Quantum Mechanics
Physics 461. Electromagnetic Theory I
Physics 462. Electromagnetic Theory II
Physics 465. Statistical Physics
or
Physics 449. Independent Study

Social Sciences Major

Administered by the Social Sciences Division

The major in Social Sciences is designed for the cadet whose interests and abilities lie in the area of the social sciences but who prefers a broader background than a major in only one discipline would provide. The major requires completion of at least one course, as indicated below, beyond the core in each of the following disciplines: Economics, Geography, Management, Political Science, Law and Behavioral Science. More concentrated study in one discipline may be attained through the use of academic divisional options.

In addition to the core curriculum, the following courses are required for the major:

One Economics course from the following options:
Econ 333. Price Theory
or
Econ 351. Comparative Economic Systems
or
Econ 374. Survey of International Economic Issues
or
Econ 456. Macroeconomic Theory
Geog 320. Principles of Geography

One Management course from the following options:
Mgt 346. Organization Theory
or
Mgt 360. Decision Analysis
or
Mgt 361. Personnel Management and Industrial Relations

One Political Science course from the following options:
Pol Sci 232. Comparative Politics
or
Pol Sci 383. American Foreign Policy: Process and Issues
or
Pol Sci 385. Public Administration and U.S. Public Policy

One course unit in law
One course unit in behavioral science
Two academic divisional options
One open option

PERSONNEL DIRECTORY

OFFICERS OF ADMINISTRATION

SUPERINTENDENT

LT GENERAL JAMES R. ALLEN

BS, United States Military Academy; MSBA, George Washington University

DEAN OF THE FACULTY

BRIG GENERAL WILLIAM T. WOODYARD

BS, AM, University of Missouri; PhD, University of Denver

COMMANDANT OF CADETS

BRIG GENERAL STANLEY C. BECK

BS, United States Military Academy; MS, George Washington University

DIRECTOR OF ATHLETICS

COL JOHN J. CLUNE

BS, United States Naval Academy; MS, University of Southern California

CHIEF OF STAFF

COL GEORGE J. NELSON

BS, United States Military Academy; MS, George Washington University

DIRECTOR OF ADMISSIONS AND REGISTRAR

COL WILLIAM R. JARRELL, JR.

BS, United States Military Academy; MA, George Washington University

ACADEMY STAFF

COL RICHARD S. FOSTER, Command Surgeon — MD, Duke University

COL ROBERT J. SHANNON, Command Chaplain — BA, MA, STB, St Mary of the Lake Seminary, Mundelein, IL

COL JOHN K. ENGLAND, Jr, Deputy Chief of Staff/Personnel — BS, Texas A&M University; MA, George Washington University

COL JOHN L. WAGNER, Deputy Chief of Staff/Operations — BS, University of Notre Dame; MBA, University of Michigan

COL ANDREW E. MIGALA, Deputy Chief of Staff/Comptroller — BS, Miami University, Ohio; MBA, Michigan State University.

COL DONALD R. REAVES, Deputy Chief of Staff, Engineering — BS, ME, Texas A&M University

COL JOSEPH B. SMITH, Deputy Chief of Staff, Logistics — BS, United States Naval Academy; MS, University of Colorado

COL C. L. MONTGOMERY, Jr, Inspector General — BA, Los Angeles State University; MS, George Washington University

COL MERLE D. BACON, Commander, Seiler Research Lab — BS, Wichita State University; MS, PhD, University of Oklahoma

LT COL DENNIS E. COURTANEY, Commander, Air Force Academy Preparatory School — BS, MS, PhD, Purdue University

LT COL GARES GARBER, Jr, Alumni Secretary — BS, United States Air Force Academy

LT COL JOHN H. PRICE, Director of Information — BS, East Carolina University

LT COL GARY B. REIMER, Staff Judge Advocate — BA, JD, Drake University

LT COL JOSEPH KOHUT, Executive Officer — BEd, University of Miami; MS, University of Colorado

MAJ MARIO P. BRUNETTI, Director of Protocol — BS, Los Angeles State College; MEd, Boston University

MAJ JOHN D. McCORD, Commander, USAF Academy Band — BA, Albion College

CAPT DANIEL J. FLAHERTY, Jr, Director of Administration — AB, Fordham University; MA, University of Northern Colorado, CAM

HENRY S. FELLERMAN, Major AUS (Ret), Director of Historical Studies — BA, Roosevelt University; MA, University of Denver

ACADEMIC FACULTY AND STAFF

Includes members of the Faculty and other personnel involved in cadet mission activities during the Spring semester, 1976.

Dean of the Faculty and Permanent Professor

BRIG GEN WILLIAM T. WOODYARD
BS, AM, University of Missouri;
PhD, University of Denver

Staff

COL PHILIP J. ERDLE, Vice Dean of the Faculty and Permanent Professor, Chairman of the Engineering Sciences Division — BS, United States Military Academy; MS, University of Michigan; PhD, University of Colorado

MAJ JOHN P. BRUCE, Faculty Executive; Associate Professor — BS, United States Naval Academy; MS, Air Force Institute of Technology

MAJ CARY A. FISHER, Director of Research; Associate Professor of Engineering Mechanics — BS, United States Military Academy; MS, California Institute of Technology; MA, University of New Mexico; PhD, University of Oklahoma

MAJ GEORGE M. THOMPSON, Special Assistant to the Dean; Associate Professor of Political Science — BS, United States Air Force Academy; MA, PhD, University of California, Los Angeles

LT JAMES D. CLOPPAS, Aide to the Dean — BS, Louisiana State University; MA, University of Northern Colorado

Counseling and Scheduling

LT COL WARREN L. SIMMONS, Tenure Director of Counseling and Scheduling; Associate Professor of Physics — BS, Syracuse University; MS, California Institute of Technology

MAJ EDWIN M. GLEASON, Deputy Director of Counseling and Scheduling; Chief, Academic Affairs Division; Assistant Professor — BA, Baylor University; MS, EdD, University of Tennessee

MAJ WILLIAM A. McKENNEY, Chief, Data Management Division; Instructor in Computer Science — BS, United States Air Force Academy; MS, University of Southern California; MS, University of Missouri

MAJ JOHN E. ROMERO, Academic Affairs Staff Officer; Assistant Professor — BA, Adams State College; MA, California State University at San Jose

MAJ ROLF A. TRAUTSCH, Academic Affairs Staff Officer; Executive Officer; Associate Professor — BA, MA, California State University at San Francisco

MAJ MARK A. VYCITAL, Academic Affairs Staff Officer — BA, College of St. Thomas

CAPT PHILIP G. BOGGS, Chief, Educational Research Branch — BS, Florida State University

CAPT JOSEPH T. BRYAN, Jr, Academic Affairs Staff Officer; Lecturer in Behavioral Science — BSEd, University of Georgia; MEd, University of Georgia

CAPT NELSON S. PACHECO, Chief, Scheduling Division; Instructor in Mathematics — BS, St. Mary's University of San Antonio; MS, University of Colorado

Instructional Technology

COL LELAND C. ENDSLEY, Tenure Director of Instructional Technology; Associate Professor of Geography — BS, University of New Mexico; MS, Ohio State University

MAJ BRUFORD L. DOYLE, Deputy Director of Instructional Technology — BA, MA, University of New Mexico; EdD, Oklahoma State University

Academy Libraries

Director of Libraries

LT COL CLAUDE J. JOHNS, Jr, Tenure Director of Libraries and Tenure Professor of Political Science — BS, MS, Florida State University; MA, University of Denver; PhD, University of North Carolina

Assistant Directors

MAJ BENJAMIN C. GLIDDEN, Assistant Director for Technical Services — BS, United States Military Academy; MPA, Harvard University; PhD, University of Pittsburgh

DONALD J. BARRETT, Assistant Director for Public Services — BS, College of St. Thomas; MA, University of Minnesota

DEPARTMENT OF AERONAUTICS

Professor and Head of the Department

COL DANIEL H. DALEY
BS, Purdue University
SM, Massachusetts Institute of Technology

Visiting Professor

DAVID L. KOHLMAN — AA, Graceland College; BS, University of Kansas; MS, University of Kansas; PhD, Massachusetts Institute of Technology

Tenure Associate Professors

LT COL WILLIAM A. EDGINGTON — BS, University of Cincinnati; MS, Air Force Institute of Technology; PhD, University of Oklahoma

LT COL ROBERT F. LOPINA — BS, Purdue University; ME, MS, PhD, Massachusetts Institute of Technology

LT COL LEO W. STOCKHAM — BS, United States Naval Academy; SM, Massachusetts Institute of Technology; PhD, University of Oklahoma

Associate Professors

MAJ RICHARD F. FELTON — BS, West Virginia University; MS, PhD, Air Force Institute of Technology

MAJ JAMES D. LANG — BS, United States Military Academy; MS, Stanford University; PhD, Cranfield Institute of Technology, England

Assistant Professors

MAJ JAMES N. ALLBURN — BS, United States Air Force Academy; MS, Stanford University

MAJ GLENN H. COLEMAN — BS, United States Air Force Academy; MS, Georgia Institute of Technology

MAJ JOHN M. FABIAN — BS, Washington State University; MS, Air Force Institute of Technology; PhD, University of Washington

MAJ ROBERT G. LORENZ — BS, United States Air Force Academy; MS, Air Force Institute of Technology

CAPT DAVID G. FRANCIS — BS, Virginia Polytechnic Institute; MS, University of Tennessee

CAPT GAREY T. MATSUYAMA — BS, United States Air Force Academy; MS, Air Force Institute of Technology

CAPT RICHARD J. SAJDAK — BS, University of Wyoming; MS, Texas A&M University

CAPT MICHAEL L. SMITH — BS, MS, PhD, University of Texas

Instructors

MAJ FRED H. PORTER — BS, United States Air Force Academy; MSEE, Air Force Institute of Technology

CAPT ROBERT H. BASKETT — BSME, Virginia Polytechnic Institute; MEME, University of Florida

CAPT STEPHEN M. BATILL — BS, MS, PhD, University of Notre Dame

CAPT HENRY A. BONDARUK — BS, United States Air Force Academy; MS, University of Arizona

CAPT HOWARD M. BRILLIANT — BSME, University of Pittsburgh; MSE, PhD, University of Michigan

CAPT FRED T. GILLIAM — BS, University of Tennessee; MS, Air Force Institute of Technology

CAPT JAMES A. HORKOVICH — BS, MS, Rensselaer Polytechnic Institute

CAPT FRED M. JONAS — BS, United States Air Force Academy; MS, Stanford University

CAPT RALPH S. LESLIE — BS, United States Air Force Academy; MS, Air Force Institute of Technology

CAPT RICHARD E. NEATE — BS, United States Air Force Academy; MS, Stanford University

CAPT WESTCOTT H. SMITH — BS, Princeton University; MS, Stevens Institute of Technology

CAPT CARL H. STEILING — BS, United States Air Force Academy; MS, Air Force Institute of Technology

CAPT RANDALL J. STILES — BS, MS, University of Illinois; MBA, Northwestern University

CAPT LLOYD E. STOEBNER — BS, MS, South Dakota State University

CAPT JAMES L. THOMAS — BS, United States Air Force Academy; MS, Purdue University

CAPT MICHAEL M. TOWER — BS, MS, PhD, Texas A&M University

Lecturer

LT MICHAEL S. FRANCIS — BS, MS, University of Colorado

DEPARTMENT OF ASTRONAUTICS AND COMPUTER SCIENCE

Permanent Professor and Head of the Department

COL JOHN P. WITTRY
BSAE, St. Louis University
MSAE, Air Force Institute of Technology
AAE, University of Michigan

Astronautics

Tenure Associate Professor

LT COL EDWARD J. BAUMAN — BEE, University of Minnesota; MS, Massachusetts Institute of Technology; PhD, University of California, Los Angeles

Associate Professors

LT COL ELDRED D. MERKL — BS, Auburn University; MS, PhD, Texas Tech University

MAJ THOMAS J. ELLER — BS, United States Air Force Academy; MS, Purdue University; PhD, University of Texas, Austin

Assistant Professors

MAJ HAROLD L. DANIEL — BSEE, University of Alabama; MSEE, Air Force Institute of Technology

MAJ JOHN C. DURRETT — BS, University of Kansas; MS, Air Force Institute of Technology; PhD, University of Colorado

MAJ JAMES T. JONES — BS, University of Arizona; MS, Air Force Institute of Technology

MAJ KENNETH D. KOPKE — BS, United States Air Force Academy; MS, University of California at Los Angeles

MAJ ANTHONY L. LEATHAM — BS, United States Military Academy; MS, University of Southern California; PhD, Air Force Institute of Technology

MAJ RICHARD C. WALSH — BS, United States Air Force Academy; MS, Air Force Institute of Technology

CAPT CRAIG A. BAER — BS, United States Air Force Academy; MS, Purdue University; MBA, University of California, Los Angeles

CAPT RONALD P. FUCHS — BS, MS, Virginia Polytechnic Institute and State University

CAPT JOSEPH A. L. SOULIA — BSME, Arizona State University; MSE, University of Southern California

CAPT DAVID A. WILLETT — BS, United States Air Force Academy; MS, Purdue University

Instructors

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MAJ JOHN W. MOORE — BSE, Arizona State University; MS, Air Force Institute of Technology

CAPT MARK A. DOBBELS — BS, United States Air Force Academy; MS, Massachusetts Institute of Technology

CAPT LUIS A. MACHUCA — BS, Manhattan College, New York; MSEE, Air Force Institute of Technology; MS, University of Dayton

Lecturers

CAPT ROBERT B. ASHER — BS, MS, PhD, Oklahoma State University

CAPT MARC L. SABIN — BS, United States Air Force Academy; MS, Purdue University; ScD, Massachusetts Institute of Technology

Computer Science

Tenure Associate Professors

LT COL CLIFFORD J. TRIMBLE — BS, University of Southern Mississippi; MCS, PhD, Texas A&M University

MAJ JOSEPH MONROE — BS, North Carolina A&T University; MCS, PhD, Texas A&M University

Associate Professors

LT COL GEORGE H. WALTHER — BA, BS, Louisiana State University; MA, University of Arizona; PhD, University of Texas, Austin

MAJ JOHN A. ZINGG — BGE, Omaha University; MCS, Texas A&M University; PhD, University of California at Los Angeles

Assistant Professors

MAJ JACKIE L. ANDERSON — BGE, University of Omaha; MS, Georgia Institute of Technology

MAJ LAWRENCE E. DRUFFEL — BS, University of Illinois; MS, University of London, England; PhD, Vanderbilt University

MAJ DONALD B. HICKS — BS, Lamar University; MS, Arizona State University

MAJ VANCE A. MALL — AB, Princeton University; MS, New York University; MS, Cornell University

CAPT JAMES L. GRESHAM — BS, University of Wyoming; MS, Georgia Institute of Technology

CAPT LAWRENCE G. JONES — BSIE, MSIE, University of Arkansas

Instructors

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MAJ DANIEL E. LOCKHART — BS, University of Wyoming; MCS, Texas A&M University

CAPT ROBERT N. HAWLEY — BS, United States Air Force Academy; MS, University of California at Los Angeles

CAPT RONALD E. JOY — BS, United States Air Force Academy; M.S., United States Navy Post Graduate School

CAPT JAMES R. LEGG — BS, Colorado State University; MS, University of Illinois

CAPT MARION A. PUMFREY — BS, United States Air Force Academy; MS, University of Illinois

CAPT ROBERT H. TOEWS — BS, United States Air Force Academy; MS, Air Force Institute of Technology

Education/Research Computer Center

Tenure Associate Professor

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Instructors

CAPT JULIAN W. COLE — BS, Arizona State University; MCS, Texas A&M University

CAPT WESLEY L. COOPER — BS, Colorado State University; MAS, Southern Methodist University

CAPT ALAN M. GILKES — BS, MS, Massachusetts Institute of Technology

CAPT ROBERT J. KIRKPATRICK — BS, United States Air Force Academy; MS, Purdue University

DEPARTMENT OF BEHAVIORAL SCIENCES AND LEADERSHIP

Permanent Professor and Head of the Department

COL JOHN W. WILLIAMS, Jr.
BS, MA, Appalachian State University
PhD, Mississippi State University

Tenure Associate Professors

LT COL LLOYD R. CHASON — BS, East Carolina University; MA, PhD, Baylor University

LT COL DIRK C. PRATHER — BS, MA, PhD, Arizona State University

Associate Professors

LT COL LAWRENCE F. SHARP — BA, St. Thomas College; MA, University of Nebraska; PhD, University of Minnesota

MAJ EUGENE H. GALLUSCIO — BA, Stanislaus State University; MA, PhD, Louisiana State University

MAJ JEFFERSON M. KOONCE — BS, MS, Tulane University; PhD, University of Illinois

MAJ STANLEY D. STEPHENSON — BS, Memphis State University; MS, Oklahoma State University; PhD, University of Hawaii

Assistant Professors

MAJ JOHN M. BERMUDEZ — BS, Florida State University; MEd, Our Lady of the Lake College; PhD, Arizona State University

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MAJ ADRIAN S. GOBELL — BA, Marshall University; MEd, Springfield College

MAJ JAMES E. KLUSMAN — BS, North Dakota State University; MS, Colorado State University

MAJ JAMES R. KNIGHT Jr — BA, Oklahoma University; MA, St. Mary's University

MAJ JAMES C. METSALA — BS, University of Wisconsin; MBA, University of Colorado

MAJ STEPHEN F. RAMSEY — BS, University of Oregon; MA, Ball State Univeristy

MAJ JOHN E. RASINSKI — AB, University of Detroit; MA, Texas Tech University

MAJ JOCK C. H. SCHWANK — BS, United States Air Force Academy; MS, PhD, University of Oregon

MAJ VALENTIN W. TIRMAN Jr — BS, Arizona State University; MS, University of Southern California

CAPT ROBERT G. EGGLESTON — AB, MA, Miami University, Ohio

CAPT LARRY J. PAINTER — BA, Lebanon Valley College; MA, Mississippi State University

CAPT KERMIT E. PARKER, Jr — BA, Baylor University; MA, Texas A&M University

CAPT JOHN B. STILES — BA, Rutgers University; MA, Paterson State College; MS, St. Mary's University

CAPT JOHN F. SWINEY — BA, MA, San Diego State College

CAPT JAMES H. THOMAS — BA, University of Missouri; MA, St. Mary's University

Instructors

CAPT MICKEY R. DANSBY — BS, MS, University of Florida

CAPT JACK D. HANNIG — BS, United States Air Force Academy; MS, Colorado State University

CAPT RICHARD L. HUGHES — BS, United States Air Force Academy; MA, University of Texas; PhD, University of Wyoming

CAPT BLAINE N. LEE, Jr — BA, MA, Brigham Young University

CAPT THOMAS M. LONGRIDGE, Jr — BA, University of California at Los Angeles; MA, PhD, University of Arizona

CAPT THOMAS M. McCLOY — BS, United States Air Force Academy; MS, Colorado State University

DEPARTMENT OF CHEMISTRY AND BIOLOGICAL SCIENCES

Permanent Professor and Head of the Department

COL ROBERT W. LAMB
BS, Arizona State University
MA, New Mexico Highlands University
PhD, University of Colorado

Chemistry

Distinguished Visiting Professor

ANDREW G. DE ROCCO — BS, Purdue University; MS, PhD, University of Michigan

Tenure Professor

LT COL DAVID W. SEEGMILLER — BS, MS, Brigham Young University; PhD, University of California, Berkeley

Associate Professors

LT COL CHARLES H. MEIER, Jr — BS, United States Air Force Academy; MS, University of Syracuse

MAJ JOHN P. JENDREK, Jr — BA, Johns Hopkins University; PhD, Tulane University

MAJ WILLIAM E. McDERMOTT — B.S., United States Air Force Academy; MS, PhD, University of California, Davis

CAPT MICHAEL J. MORAN — BS, Montana State University; PhD, University of Cincinnati

Assistant Professors

MAJ JOHN H. BOLES — BS, Union College; MS, University of North Carolina

MAJ FRANCIS T. CRIMMINS — BS, MS, College of the Holy Cross

MAJ ARMAND A. FANNIN, Jr — AB, Washington University; MS, University of California, Los Angeles

MAJ RONALD D. OFFLEY — BS, MS, University of Michigan

CAPT ARNOLD M. CRELIER — BS, Brooklyn College; PhD, Indiana University

CAPT WALTER P. MENZIES, Jr — BS, Loyola University; MS, Creighton University

CAPT REES W. PADFIELD — BS, MS, San Jose State College

LT RICHARD MARTIN GUIDRY — BS, University of Southwestern Louisiana; MS, PhD, University of Illinois, Urbana-Champaign

Instructors

MAJ SAMUEL P. FINCH III — BS, United States Air Force Academy; MS, University of California, Riverside

MAJ CHARLES J. LaBLONDE — BS, United States Naval Academy; MS, Massachusetts Institute of Technology

CAPT WALTER B. AVILA — BS, MS, California State University, Northridge

CAPT JOEL W. BECKMANN — BS, MS, South Dakota State University

CAPT RONALD E. CHANNELL — BS, PhD, University of Georgia

CAPT MYRON J. DeLONG, Jr — BA, Youngstown State University; MS, University of Cincinnati

CAPT JOHN S. LANDERS — BS, United States Air Force Academy; MS, Michigan State University

CAPT J. ROSS LEONARD — BS, United States Air Force Academy; MS, University of California, Davis

CAPT RICHARD E. LOTZ — BS, United States Air Force Academy; MS, University of California, Berkeley

CAPT JOHN C. NARDI — BS, MA, Bowling Green University

CAPT WILLIAM L. NOLL — BS, Auburn University; MS, University of Dayton

CAPT DONALD D. POTTER — AB, Grinnell College; MS, University of Nebraska

CAPT LaRELL K. SMITH — BS, Brigham Young University; PhD, University of Utah

CAPT WILLIAM G. THORPE — BS, Virginia Military Institute; MS, Wichita State University

CAPT RONALD D. WATRAS — BS, Northern Michigan University; MS, MEd, University of Arizona

Biological Sciences

Associate Professors

LT COL EUGENE L. ARNOLD — BS, Otterbein College; MS, PhD, Pennsylvania State University

LT COL RICHARD G. SCHMITT — BS, Lawrence University; MS, Midwestern University

MAJ ROGER C. LENT — BS, United States Air Force Academy, MS, PhD, Arizona State University

MAJ ORWYN SAMPSON — BS, MS, University of California, Los Angeles; PhD, University of Oregon

MAJ TED SCHROEDER — BS, United States Air Force Academy; MS, PhD, Colorado State University

MAJ CHARLES E. THALKEN — DVM, Colorado State University; MS, Texas A&M University

MAJ MANUEL A. THOMAS, Jr — DVM, Kansas State University; MS, Colorado State University

MAJ WILLIAM C. WILSON — DVM, Iowa State University; MS, Colorado State University

CAPT ALVIN L. YOUNG — BS, MS, University of Wyoming; PhD, Kansas State University

Assistant Professors

LT COL LAWRENCE R. KLINESTIVER — BA, BS, Washburn University; MT (ASCP), Lovelace Foundation; MS, University of New Mexico; PhD, Colorado State University

MAJ JOHN B. BOMAR, Jr — BS, University of Alabama; MS, PhD, University of Texas

MAJ GLENN M. BUCHANAN — BA, University of California; MA, University of Colorado

MAJ LORRIS G. COCKERHAM — BA, Louisiana College; MS, Colorado State University

MAJ CALVIN D. PAYNE — BS, Clarion State College; MS, University of Utah

MAJ MICHAEL A. PHILLIPS — BS, United States Air Force Academy; MS, Colorado State University

MAJ THOMAS E. SIMONDI — BS, University of Arizona; MS, Air Force Institute of Technology

CAPT JOHN C. ALLEN — BS, MS, University of Wyoming; PhD, Colorado State University

CAPT GERALD L. K. BARGREN — BA, Rockford College; MS, University of Iowa

CAPT. LAWRENCE J. BIEVER — BS, MS, South Dakota State University

CAPT JAMES M. CUPELLO — BS, United States Air Force Academy; MS, Rutgers University; PhD, University of Kansas

CAPT JAY M. HOWARD — BS, San Diego State College; MS, California State University, San Diego

Instructors

MAJ HERBERT W. CULLERS, Jr — BS, Oklahoma State University; MS, Colorado State University

CAPT LUCIAN B. EDDY, Jr — BS, United States Air Force Academy; MS, Colorado State University

CAPT MICHAEL J. MASON — BS, United States Air Force Academy; MS, Colorado State University

CAPT MARTIN D. ZAHN — BA, Cornell College; MPh, Yale University

CAPT ROBERT H. ZELLERS — BS, University of Nebraska; MS, University of Southern California

DEPARTMENT OF CIVIL ENGINEERING, ENGINEERING MERCHANICS AND MATERIALS

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MAJ JOHN S. ROGERS, AOC Squadron 4 — BA, Willamette University

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MAJ JAMES R. SPURGER, AOC Squadron 6 — BA, Texas A&M University

MAJ CHARLES P. LOWRY, AOC Squadron 7 — BA, Oberlin College

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MAJ JOHN C. LEE, AOC Squadron 10 — BS, Iowa State University; MA, Louisiana Tech University

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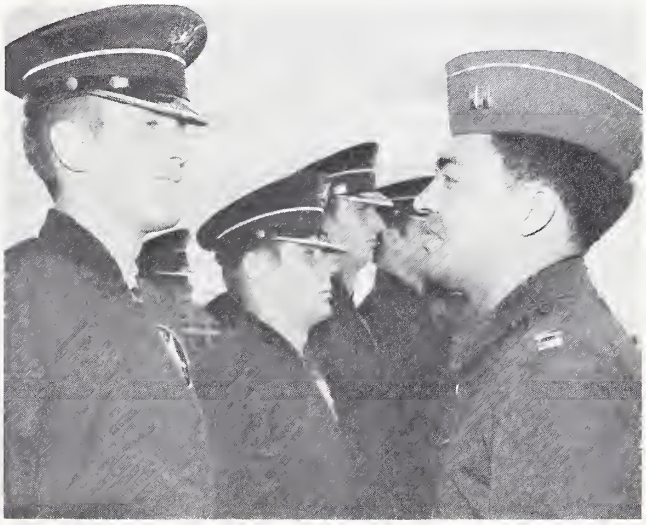
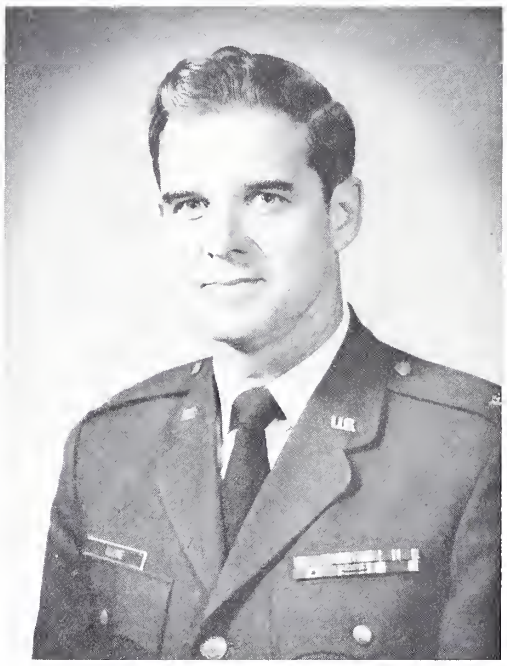


PHYSICAL EDUCATION AND ATHLETICS



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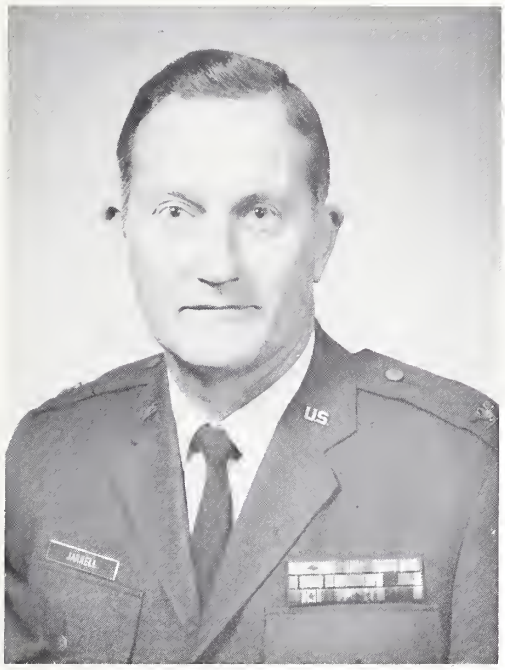

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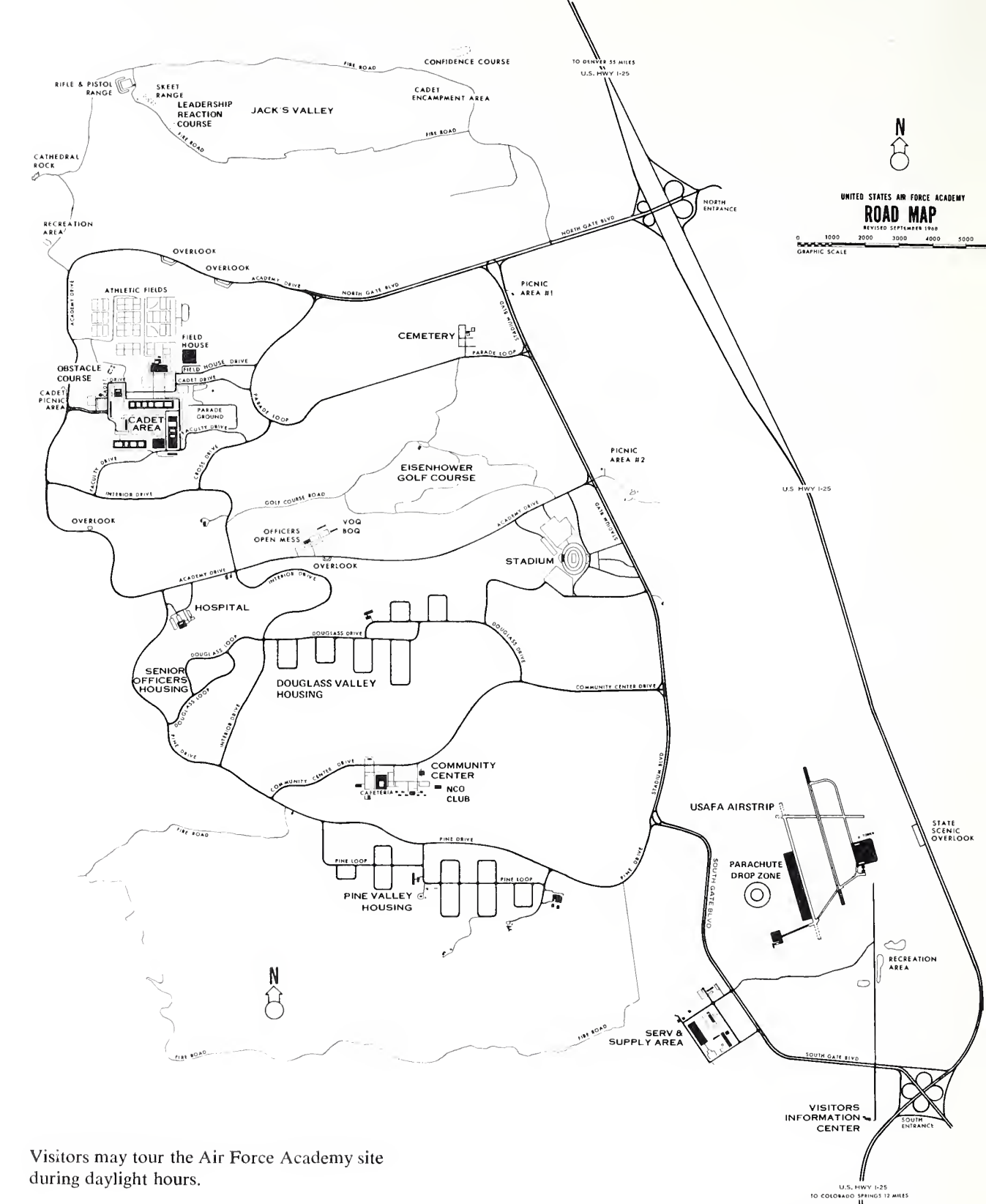

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